

Prologue

Psychology: scientific study of behaviour & mental processes.

Key word = science

Behaviour: anything an organism does

Mental processes: internal, subjective experiences we create from behaviour; sensations, perceptions, dreams, beliefs, feelings

*in early days, psyc=science of mental life.

*today psyc is a discipline that connects w diversity of other fields.

Socrates and Plato: mind can separate from the body and continue after body dies. Knowledge is innate. Born within us. (400s bc) (*duality*)

Aristotle: derived principles by logic. Soul cannot be separated from the body. Knowledge was NOT preexisting. Knowledge grows from experiences stored in our memories.

Rene Descartes: (1595) ideas are born with the minds being but entirely separate from the body. Body and mind are separate. The mind can survive its death. Thought that nerves in body were spirits.

John Locke: (1632) thought mind at birth is a **blank slate** where experiences are added. Beginning of empiricism.

*also **Francis Bacon:** saw importance of orderly observation & experimentation.

Empiricism: view that knowledge comes from experience via the senses, and science flourishes thru observation and experiment. View that science flourishes thru observation and experimentation!

Wilhelm Wundt: Experimental psychology; Germany university of Leipzig, first psyc lab.

Edward Titchener: cornell university. Introduced **Structuralism**

-used **introspection:** looking inward at peoples reports of their experience. Unreliable subjective.

*Wundt and Titchener focus on inner sensations, images, feelings.

Structuralism: early school of psyc using introspection to explore elemental structure of human mind.

William James: looked at functions of thoughts and feelings.

Thought smelling was adaptive. From ancestors. Consciousness serves a function to consider our past/present/future. **Functionalism:** explored emotions, memories, and consciousness. Also looked at introspective stream of consciousness and emotion. *wrote first psyc book called "principles of psyc"

Functionalism: school of psyc focused on how mental & behavioural process function-how they enable organisms to adapt, survive, and flourish. Adaptive value and thoughts and behaviours.

1920s: John B. Watson & B.F. Skinner: Behaviourists: psyc has to be scientific study of observable behaviour. Science rooted on observation.

Sigmund Freud: Austrian physician, emphasized ways emotional responses to childhood experiences and our unconscious thought process affect our behaviour.

Humanistic Psychology: view that emphasized growth potential of healthy people; used personalized methods to study personality to grow personally.

Carl Rogers and Abraham Maslow: importance of current environmental influences on our growth potential, importances of meeting needs for love.

Psych's Big Debate

Nature-nurture issue: controversy over relative contributions that genes and experience make development of psyc traits and behaviorus. Relative contributions of biology & experience Do we develop traits bc we develop them thru experience or are we born w them.

Natural Selection: idea that trait variations are inherited contributing to reproduction and survival. Those traits most likely to be passed down. Charles Darwin.

Psych's Three main levels of analysis

Levels of analysis: differing complementary views from biological to psychological to social-cultural for analyzing given phenomenon.

-we r each complex system built of smaller parts (cells molecules atoms)

Biosychosocial approach: integrated perspective that incorporates biological, psychological, and social cultural levels of analysis.

-behaviour or mental processes are influenced by biological, psychological, and social-cultural influences. (see pg 10)

*dif perspectives can complement one another. True of dif academic disciplines.

Basic Research: pure science that aims to increase scientific knowledge base.

Applied research: scientific study that aims to solve practical problems (industrial/organizational psychologists study and advise on behaviour in the workplace. Train employees more effectively.

Counseling psychology: branch of psyc helping people w problems in living. (related to school/work/marriage/achieving greater well-being. Help cope w challenges

Clinical psyc: branch of psyc that studies, asses, and treats people w psyc DISORDERS. Treat emotional and behaviour problems.

Psychiatry: branch of MEDECINE dealing w psyc disorders. Practiced by physicians who sometimes provide med (drug) treatments as well as psyc therapy.

Five effective study techniques

1-distribute study time

2-listen actively in class

3-overlearn

4-focus on big ideas

5-be smart test taker

SQ3R (study, question, read, review, reflect)

Neuroscience perspective: how body and brain create emotions, memories, sensations.

Behavioural perspective: mechanisms by which observable responses are required and changed.

Cognitive Perspective: how mind encodes, processes, stores, and retrieves info.

Psychodynamic perspective: disguised effects of unfulfilled wishes and childhood traumas

Chapter 1: Thinking Critically w Psychological Science

Hindsight Bias: tendency to believe after learning an outcome, that one would have foreseen it (I knew it all along)

-we think something is obvious once it has been explained w evidence. Finding something has happened makes it seem like its going to happen anyway. Inevitable. W 20/20 hindsight, everything seems obvious.

Overconfidence

-once people know target word, hindsight makes it obvious-so much so that we become overconfident. (wreat-water)

*hindsight bias and overconfidence often lead us to overestimating our intuition. Scientific inquiry, fed by curious skepticism helps sift out illusions.

Scientific Attitude

-to sort thru reality/fantasy, sense/nonsense, a **scientific attitude** is required: being skeptical but not cynical, open minded but not gullible. **Curious skepticism.**

Two questions: what do u mean? How do u know? Show me evidence.

-**skepticism & HUMILITY r needed.** May have to reject our own ideas.

Critical Thinking: thinking that does not blindly accept arguments and conclusions. It EXAMINES assumptions, discerns hidden values, evaluates evidence, and assesses conclusions. Smart Thinking.

-ask questions. How, what, is conclusion based on anecdote and gut feelings or evidence.

Scientific Method: make observations, form theories, refine theories in light of new observations.

Scientific Theory: explanation using integrated sets of principles that organizes and predicts observations. Organize observations/predict that anyone can check theory.

-**explains principles that organize and predict behaviour of events.** Simplifies. After observations, theory is made.

Hypothesis: testable prediction. Often implied by theory.

Operational definition: statement of procedures (operations) used to define research variables. for ex. human intelligence may be operationally defined as what an intelligence test measures.

Replication: being able to repeat the essence of the research study, w dif participants in dif situations. Basic findings extend to other participants and circumstances.

Example:

1) **Theory:** low self esteem=feeds depression

2) **hypotheses:** people w low self-esteem score high on depression scale

3) **research/observations:** do experiment/analyze

Case study: observation technique where ONE person is studied in DEPTH to reveal universal principles (things that apply to many people.)

-suggest hypotheses for further study. Show us what CAN happen. UNRELIABLE if individual=special.

-leads to mistaken judgements and false conclusions.

-can overwhelm general truths.

*individual cases can suggest fruitful ideas. What's true of us all can be glimpsed in one of us. But to look at general truths that cover individual cases, we have to answer questions w other methods.

Survey: technique to look at self-reported attitudes and behaviours of people, usually by questioning a representative, random sample of them. LESS DEPTH

-asks people to report their behaviour & opinion.

-ask DIF QUESTIONS answers will VARY

-**word effects:** subtle changes in order of wording cause major effects. Phrasing.

Random Sampling

False Concensus Effect: tendency to overestimate extent to which others share our beliefs & behaviours: we think people think like us. Vegetarians think more people are vegetarians than meat eaters. Conservatives think more support conservatives than libs.

-george sees lady pay w food stamps, watches in dismay when she drives off in fancy car.

*best basis for generalizing is from a representative sample of cases.

Population: all cases in a group from which samples may be drawn for a study.

Random sample: sample that is representative of pop bc ea member has equal chance of inclusion.

-**Large sample=better than small. But small REPRESENTATIVE sample = better than unrepresentative 500.**

*before believing surveys, thinkcritically. Consider sample. Representative or not.

Naturalistic observation: observing and recording behaviour in naturally occurring situations w/out trying to manipulate and control situation. Does not EXPLAIN behaviour. It DESCRIBES behaviour. Shows chimps sometimes insert stick in a termite mound and withdraw it, eating loads of termites. Doesn't say why. Observe people in bar in natural surroundings. Does not describe why they might be aggressive.

Measuring naturalistic observations.

Correlation: measure of extent that two factors move together. How well either factor predicts the other.

Correlation Coefficient: mathematical expression of relationship, ranging from -1 to +1 (+ or - means direction of relationship. + = one up other up. - = one up one down) # = STRENGTH of relationship.

-neg correlation: two things relate inversely. More TV = less time reading.

-pos: more sex content, more likely to have sex.

Scatterplot: graphed cluster of dots, ea of which represent values of two variables. Slope of points suggests direction of relationship between the two variables. Amount of scatter suggests strength of correlation (little scatter=HIGH correlation)

***correlation helps see world more clearly by showing how two things relate. Help predict.**

-**CORRELATION DOES NO PROVE CAUSATION**

-ex. in men, length of marriage correlates positively w hair loss but not cause bc both are associated w third factor AGE.

-**correlation does not prove causation. Correlation indicates possibility of a cause/effect relationship, but does not prove it.**

Illusory Correlations: when we believe there is a correlation but there isn't one. We are likely to notice and recall instances that confirm our beliefs. **Perception of a relationship that does not exist.**

-people think weather is related to their discomfort. Not true
*when we notice random coincidences, we may forget they r random and instead, see them as correlated. Easily deceive ourselves.

Perceiving order in random events

-illusory correlations start from natural eagerness to make sense out of randomness.
-random sequences often don't look random.

Daniel Kahneman and Amos Tversky: experiment w heads and tails. HHHTTT or HTTHTH or HHHHHH what is most random. People think HTTHTH is most random but all are just as likely to happen.

-some happenings are so extraordinary we struggle to conceive an ordinary chance related explanation.

Experimentation

Experiment: Research method where investigator manipulates one or more factors (independent variables) to observe the effect on some behaviour or mental process (dependent variable). By random assignment of participants, experimenter aims to control other relevant factors.

- 1) manipulate factors of interest (independent)
- 2) hold constant other facts.

*unlike correlational studies, which uncover naturally occurring relationships, experiment manipulates a factor to determine its effect.

Evaluating Therapies

Double-blind procedure: experimental procedure in which both research participants and research staff are ignorant (blind) of if research participants have actual treatment or placebo. Commonly used in drug evaluation studies

Placebo effect: experimental results caused by expectations alone; any effect on behaviour caused by administration of an fake substance, which patient thinks to be active agent.

Experimental condition: condition of experiment that exposes participants to treatment.

Control condition: condition that contrasts w experimental condition and serves to compare for evaluating effect of treatment. (control group nothing is done to them)

Random assignment: people put in experimental or control conditions to minimize preexisting differences between those assigned to dif groups. (gets rid of age dif, attitudes, etc)

Independent Variable: experimental factor that is manipulated. Variable whose effect is under study. Manipulate dosage of drug.

Dependent variable: outcome factor. May change in response to manipulations of independent variable. Causes change in men's response to Viagra for ex.

*to discover causation, psyc's may randomly assign participants to experimental treatment or control condition. Measuring the dependent variable (intelligence score) will determine effect of independent variable (type of milk fed to baby)

ex. condition: independent variable: dependant variable
experimental: breast milk : intelligence score
control : formula : intelligence score

Variable: anything that can vary (infant nutrition, intelligence, TV exposure.) experiments manipulate an independent variable, measure the dependent variable, control others.

Statistical Reasoning

*doubt big, round, undocumented numbers. Rather than believe estimates, focus on thinking smarter and applying simple statistical principles to everyday reasoning.

- 1) gather and organize data
- 2) graph data (use bar graph)

*read scales and note range.

Measures of central tendency: single score that represents a whole set of scores.

Mode: most frequently occurring scores in distribution

Mean: arithmetic average of distribution. Obtained by adding scores and divide by number of scores. Biased by a few extremes.

Median: middle score in distribution; half the scores are above it and half are below it. Middle #.

*always note which measure of central tendency is reported. If it is mean, it could be influenced by scores that distort it. "skewed distribution effects MEAN"

Measures of variation: how similar or dif scores are.

Averages derived from scores w low variability are more reliable than averages based on scores w high variability. Ex. if person scores 13-17 points in 10 games straight u know the 6th game may be around 15 pts than if her scores had varied from 5-25.

Range: dif between highest and lowest scores on distribution

Standard deviation: computed measure of how much scores vary around MEAN score. How far off u are from the average.

* if ur university has students of same ability level, ur intelligence scores will have smaller standard deviation than if u have more diverse intelligence.

Making Inferences: 3 principles for making safe generalizat

1) representative samples are better than biased samples

2)less-variable observations are more reliable than those that are more variable (consistency in observations)

3)more cases are better than few. (averages based on many cases are more reliable.)

*generalizations based on few unrepresentative cases are unreliable.

When is a difference significant

Statistical Significance: statistical statement of how likely it is that a result occurred by chance.

-if dif between sample averages is large, we have more confidence that difference between them shows a real dif in a population. When sample averages are reliable and dif between them is relatively large, we say there is statistical significance.

***doubt happens if chance of random occurrence is more than 5%.**

***dif between samples may be statistically significant but not practically significant.**

*stat significance indicates the likelihood that a result will happen by chance. It does not indicate importance of the result.

*if dif between two samples is large, we can assume dif is significant and result did not occur by chance.

Can lab experiments illuminate everyday life?

-experimenter intends lab to be simplified reality. Purpose is not to re-create exact behaviors of everyday life, but test theoretical principles. Resulting principles not the specific findings help explain everyday behaviours.

*as psychologists, concerns lie less w particular behaviour and more w general principles that explain many behaviours.

Does behaviour depend on culture?

Culture: enduring behaviours, ideas, attitudes, traditions, shared by large group of people and transmitted from one generation to the next.

*even specific attitudes and behaviours vary across cultures. Underlying processes are much the same.

Does behaviour vary w gender?

-gender matters. Biology determines our sex. Culture further bends genders. Yet in many ways, female and male=similar human.

Why do psychologists use animals?

-use animals to learn about people

Is it ethical to experiment on animals?

-animal researchers say not morality of good vs evil, but compassion for animals vs compassion for people.

-place well-being of humans above animals. Is it right that mice get tumors in hope that people don't.

-sacrifice animals for human well-being.

-value animals according to their perceived kinship w us. (love dogs more than rats.)

-human life=first priority, second issue is priority we give to well-being of animals in research.

Ethical to experiment on people?

-ethical principles developed by American psyc association and british psyc society urge people to

1) be informed of consent of potential participants

2) protect people from harm and discomfort

3) treat info about individual participants confidentially

4) fully explain research afterward

is psyc free of value judgements?

-our preconceptions can bias our observations and interpretations. Sometimes we see what we want to see.

-labeling sex acts we do not practice as "perversions" or as "sexual variations" conveys value of judgement.

-labels describe and evaluate.

Is psyc dangerous?

-is psyc used to manipulate people. Knowledge like all power is used for good or evil. Psyc does have power to deceive, but purpose is to enlighten.

*replication is NOT a basic research technique used by psychologists.

*when a dif between two groups is "statistically significant" this means that the dif is not likely to be due to chance variation.

*john thinks he can open an online trading account and pick the right stocks that will make him rich=overconfidence.

Chapter 2: Neuroscience and Behaviour

*everything psychological is simultaneously biological.

Plato=thought mind was in spherical head

Aristotle=thought mind was in heart

Franz Gall: German 1800s invented **Phrenology:** theory claiming bumps on the skull could reveal our mental abilities and our character traits. Not a true theory.

-but dif parts of brain DO control dif aspects of BEHAVIOUR

-various brain regions DO have specific functions.

Biological Psyc: links between Biology and Behaviour.

-links between biological activity and psyc events.

-aka hunger and sex. Stress and disease.

Neural Communication

*body's info system is built from billions of interconnected NEURONS

-cells to body organs/heart/brain to digestive system/circulation/info processing.

-largest system=individual/family/culture

we are **biopsychosocial systems.**

Neurons

Neuron: nerve cell; basic building block of nervous system

Dendrite: bushy, branching extensions of a neuron that receive messages and conduct impulses TOWARD the cell body.

Receive information.

Axon: extension of a neuron, ending in branching terminal fibers. Messages pass to other neurons or to muscles or glands THRU the axons and reach the dendrites of the next neuron.

-axon fibers pass message along to other neurons. Axons speak, dendrites listen.

*axons=very long, travel several ft thru body.

Dendrites=short

Motor neurons: control muscles. Really long

Myelin Sheath: layer of fatty tissue segmentally encasing fibers of many neurons; enables faster transmission speed of neural impulses as impulse hops from one node to the next.

***Multiple Sclerosis:** disease where myelin sheath degenerates. Result=slowing of all communication to muscles and eventual loss of muscle control.

*axon fires impulse when it receives signal from sense receptors stimulated by **pressure, heat or light.** Or when stimulated by neighbor neurons.

Action Potential: neural impulse, brief electrical charge that travels DOWN axon. Action potential generated by movement of positively charged atoms in and out of channels in axon's membrane.

Ions: neuron generates electricity from chem. Events. Involves exchange of ions. Electrically charged atoms.

-at rest, fluid interior of resting axon = negative. Excess of neg charged ions

-at rest, fluid of exterior of resting axon=positive. Excess of pos charged ions.

At Rest: Interior=neg, exterior=pos

Resting potential: this resting state.

Axon Surface=selectively permeable

Action Potential

1) first bit of axon gates open, pos charged Na ions flow in

2) produces **depolarization** of part of axon. Causes next channel to open

3) Na/K pump transports sodium ions back out of cell

4) action potential continues down axon.

-during resting stage **Refractory period** neuron pumps pos charged Na back outside so it can fire again.

Excitatory: signal that causes neurons to fire

Inhibitory: prevent signals.

Threshold: level of stimulation required to trigger neural impulse

*action potential goes DOWN axon, which branches into junctions of thousands of other neurons.

-increase stimulus above threshold DOES NOT increase action potential INTENSITY.

All or none response: increased stimulus does not mean stronger impulse.

-strong stimulus=causes more neurons to fire, but does not affect action potential speed or strength.

How neurons communicate

Synapse: junction between axon tip of sending neuron and the dendrite or cell body of the receiving neuron. The tiny gap at this junction is called synaptic gap or cleft.

Neurotransmitters: chemical messengers that travel across synaptic gap between neurons. When released by sending neuron, NT travels across synapse, binds to receptor sites on receiving neuron, and influences whether the next neuron will make an impulse.

Reuptake: sending neuron reabsorbs excess NT molecules. Excess NT's are reabsorbed by sending neuron.

*speed of NT = 1/10 000 second.

How Neurotransmitters influence us

Acetylcholine: NT that enables learning and memory and triggers muscle contraction.

-ACh is messenger at every junction between a motor neuron & skeletal muscle. ACh is released to muscle cells, and muscle contracts. ***if ACh is blocked, muscles WONT contract!**

-Alzheimer's disease: ACh-producing neurons deteriorate.

-enables muscle action: learning, memory.

Dopamine: influences movement, learning, attention, emotion

-too much=schizophrenia

-too little=tremors and parkinsons disease

Serotonin: affects mood, hunger, sleep, arousal

-too much=wow awake (antidepressants raise serotonin levels)

-too little=depression

Norepinephrine: control alertness and arousal

-too little=depressed

GABA: major INHIBITORY NT

-too little=seizures, tremors, insomnia

Glutamate: excitatory NT involved in memory

-too much=overstimulate brain, migraines/seizures.

Candace Pert & Solomon Snyder: attached radioactive tracer to morphine, showing where it went in animal brain.

Morphine=opiate drug elevates mood/eases pain. Bound to receptors in areas linked w mood and pain sensations.

Morphine=similar to endorphins

Endorphins: natural opiates of brain released in response to pain and vigorous exercise. "morphine within". Linked to pain control and pleasure.

How drugs alter neurotransmission

*if u have too many opiates like morphine/heroin, then UR brain will STOP producing natural endorphins!!!!

-drug addicts have discomfort that keeps going til brain gets more natural or artificial opiates.

-mood altering drugs have similar effect. Unpleasant aftereffects.

Agonists Excite: molecule looks similar to NT to mimic its effects.

*too much ACh from black widow and u have seizure and die. Violent muscle contractions.

Antagonists inhibit: drug molecule that inhibits NT release

*Butolin: poison from improperly canned food causes paralysis by blocking ACh release. Botox=blocking ACh release from sending neurons in face.

Agonist=pretends to be NT (morphine)

Antagonist=blocks NT (Curare poison paralyzing victims by blocking ACh)

Blood Brain Barrier: enables brain to fence out unwanted chemicals circulating in blood. For ex. dopamine cannot be given to person w low levels of dopamine and parkinsons bc it wont make it across blood brain barrier. Have to use other chemical similar. (L-dopa)

Nervous System: body's speedy electrochemical communication network, consisting of all nerve cells of peripheral and central nervous system.

Central Nervous System(CNS): brain and spinal cord

Peripheral Nervous System(PNS): sensory and motor neurons that connect CNS to rest of body.

Nervous System:

PNS

-Autonomic (controls self regulated action of internal organs and glands

-Sympathetic: arousal

- parasympathetic: calming

-Somatic: controls VOLUNTARY movements of skeletal muscles

CNS

-brain and spinal cord.

Nerves: neural cables containing tons of axons. These bundled axons which are part of PNS connect CNS w muscles, glands, and sense organs

3 types of neurons

Sensory Neurons: neurons that carry incoming info from sense receptors to CNS (body has a few million)

Motor Neurons: neurons that carry outgoing info from CNS to muscles and glands. (body has billions)

*sensory IN motor OUT

Interneurons: CNS neurons that internally communicate and intervene between sensory inputs and motor inputs.

Peripheral Nervous System: two components: somatic and autonomic system.

Somatic Nervous System: part of peripheral that controls voluntary skeletal muscles.

Autonomic nervous system: controls glands and muscles of internal organs (like heart.)

-Sympathetic: arouses the body, mobilizing its E for stressful situations.

-dilate pupil

-accelerate heart

-inhibit digestion

-stimulate glucose release by liver

-stimulate secretion of epinephrine, norepinephrine

-stimulate ejaculation in male

-make u sweat (perspire)

-make u alert for action

- Parasympathetic:** calms body, conserving E
- contract pupil
- slow heart
- stimulate digestion
- stimulate gallbladder
- contract bladder
- allow blood flow to sex organs
- conserve energy

Central Nervous System: Spinal cord and brain

- spinal cord=info highway connecting peripheral nervous system w brain.
- ascending neural fibers send up SENSORY info, descending fibers send MOTOR control info.

Reflexes: automatic responses to stimuli. Simple, automatic, inborn response to a sensory stimulus like a knee jerk.

- simple spinal reflex is composed of a single sensory neuron and single motor neuron. Sometimes communicated thru interneuron.

*hand jerks away from flame BEFORE ur brain receives and responds bc of natural reflex.

*interneuron is at spinal cord. Before brain.

*to produce bodily pain or pleasure, sensory info must reach brain.

Brain and neural networks

Neural Networks: interconnected neural cells. Networks can learn, as feedback strengthens or inhibits connections that produce certain results. Computer simulations of neural networks show analogous learning.

- neurons network w nearby neurons so they can have short fast connections. Cells in ea layer of neural network connect w various cells in next layer.

*learning STRENGTHENS connections. BUILD NETWORK

Endocrine System: the body's "SLOW" chemical communication system; set of glands that secrete hormones to bloodstream. SNAIL MAIL several seconds for bloodstream to get hormone to tissue it needs to be.

Hormones: chem. Messengers, mostly those manufactured by endocrine glands, that are produced in one tissue and affect another.

- hormones originate in one tissue, travel thru bloodstream, and affect other tissues including brain. Act on brain and influence sex food and aggression.

-some hormones are chemically IDENTICAL to some NT's.

-endocrine effects last longer than neural message.

Adrenal Gland: pair of endocrine glands just above kidneys. Secrete hormones Epinephrine (adrenaline) and Norepinephrine (noradrenaline) help arouse body in times of stress. Increase blood sugar, providing E

Pituitary Gland: endocrine's most influential gland. Regulates growth and controls other endocrine glands. Controlled by Hypothalamus. Master gland.

*some hormones are chemically identical to NT's.

The Brain: Tools of Discovery

Lesion: tissue destruction. A naturally or experimentally caused destruction of brain tissue.

*oldest method of study=observe effects of brain diseases and injuries in a clinic.

Manipulating the brain

-electrically, chemically, or magnetically STIMULATE various parts of brain to see effect.

-surgically lesion tissue

-or just observe.

Recording Brain's Electrical Activity

Electroencephalogram (EEG): an amplified recording of the waves of electrical activity that sweep across the brain's surface. These waves are measured by electrodes placed on scalp.

PET (positron emission tomography scan: visual display of brain activity that detects where a radioactive form of glucose goes while the brain performs a given task.

-shows where brain uses up glucose. Person is given radioactive form of glucose, PET locates and measures radioactivity. Brain areas light up.

MRI (magnetic resonance imaging): technique using magnetic fields and radio waves to produce computer generated images that distinguish among dif types of soft tissue; allows us to see structures w/in brain.

-detailed pic of brain and body soft tissues.

fMRI (function MRI): technique for revealing blood flow, and brain activity by comparing successive MRI scans. MRI scans show brain anatomy, fMRI show brain function.

-reveals functioning and structure. Where brain is active, blood goes.

Older Brain Structures: primitive animals (sharks) =simple brain . low mammals (rats) that need lots of motion=more complex. Advanced animals (humans)=very complex

The Brainstem: the oldest part and central core of brain, beginning where spinal cord swells as it enters the skull; brainstem is responsible for automatic survival functions.

*crossover point where most nerves to and from ea side of brain connect w body's opposite side

Medulla: base of brainstem; controls heartbeat and breathing.

Pons: just above the medulla. Coordinates movements.

Reticular Formation: nerve network in brainstem that plays important role in controlling arousal. (located between ur ears) -leads right up to the thalamus. Filters incoming stimuli and relays other important info to other areas of brain.

Thalamus: top of brainstem.

Brainstem: Medulla-pons-reticular formation-thalamus

Giuseppe Moruzzi and Horace Maguon: found cat awakens if reticular formation=stimulated electrically. Sever reticular and cat went into coma. Thus reticular formation=arousal

Thalamus: brain's sensory switchboard, located at top of brainstem; directs messages to sensory receiving areas in cortex and transmits replies to cerebellum and medulla. (does not receive senses fom smell) but does sense seeing, hearing, taste, touch.

Cerebellum: "little brain" attached to rear of brainstem; functions include processing sensory input and coordinating movement output and balance. Extends from rear of brainstem. Baseball size. (brain's organ of agility. Movement) -enables nonverbal learning and memory. Judge time, modulate emotions, voluntary movement.

*if injured cerebellum, have difficulty walking, keeping balance, shaking hands. Movements would be jerky/exaggerated.

Limbic System: a doughnut shaped system of neural structures at border of brainstem and cerebral hemispheres; associated with emotions such as FEAR and AGGRESSION and drives them for food and sex. Includes HIPPOCAMPUS, AMYGDALA, and HYPOTHALAMUS.

Amygdala: two lima bean sized neural clusters. Part of limbic system. Linked to EMOTION. (influence fear and aggression)
*no amygdala=normally ill tempered monkey now calm

Hypothalamus: neural structure lies below thalamus; directs activities for maintenance. Eating drinking, body T. controls endocrine system via pituitary gland. Linked to EMOTION
*influence hunger, thirst, body T, sex behaviour.
*monitors blood chemistry. Activity also gives pleasure reward

Hippocampus: processing memory. If animals lose hippocampus, they can't process new memories or facts.

James Olds & Peter Milner: experiment w rat. Found rat wanted stimulation of "pleasure center" of brain. Centers in or near hypothalamus. Release of NT's like dopamine.

Limbic centers for pleasure

Reward Deficiency Syndrome: deficiency in natural brain systems for pleasure and well-being. Lead people to crave whatever provides missing pleasure feelings or relieve neg pleasure.

Cerebral Cortex: intricate fabric of interconnected neural cells that cover cerebral hemispheres; body's ultimate control and information processing center.

-makes humans complex in brain compared to others.

*brain hemispheres' thin surface layer-contains 20-30 billion nerve cells.

-wrinkled surface. Folds increase brain surface area.

Glial Cells: cells in nervous system that support, nourish, and protect neurons. "glue cells" guide neural connections. Provide nutrients for myelin. Mop up ions and NT's. "neural nannies"

Each hemisphere=divided into four LOBES separated by FISSURES or folds.

Frontal Lobe: portion of cerebral cortex lying just behind forehead. Involved in speaking and muscle movements, making plans and judgements. Appropriate/inappropriate (front)

Parietal lobes: portion of cerebral cortex lying at top of head and toward rear. Receives sensory input for touch and body position. (top and rear of head)

Occipital Lobes: portion of cerebral cortex at back of head. For vision. Includes visual areas, receive visual info from opposite visual field. (back of head)

Temporal Lobes: above ears. Includes auditory areas.

Receives auditory info from opposite ear. (sides of head)

Motor cortex: area at rear of frontal lobes controlling voluntary movements. (left motor cortex controls right side of body) parts of body that need lots of detail movement get bigger parts of motor cortex. Sends OUT info

*body parts are moved by OPPOSITE sides of brain.

Wilder Penfield of Montreal: mapped out motor cortex in hundreds of wide awake patients. Painlessly stimulated different areas of motor cortex at back of frontal lobe and different body parts moved. *areas of body needing precise control, (fingers/mouth) get most cortical space on motor cortex.

Sensory Functions: Penfield identified cortical area that specializes in receiving info from skin senses and from movements of body parts.

Sensory Cortex: area at front of parietal lobes that registers and processes body touch and movement sensations. Parallel to motor cortex just behind it at front of parietal lobes.

*stimulate it, and person thinks they are being touched.

*more sensitive a body region, the larger an area of sensory cortex it gets. (supersensitive lips get more than toes)

***stimulate occipital=see dash of colour.** From occipital, visual info goes to other parts of brain to identify words, detect emotion, recognize face. Sound you hear=processed by auditory areas in temporal lobe.

Association Areas: areas of cerebral cortex that are not involved in primary motor or sensory functions; rather, they are involved in higher mental functions such as learning, remembering, thinking, and speaking. HIGHER mental functions Association=3/4s of cerebral cortex. Integrate info. Storing memories.

*more intelligent animals=more uncommitted or association areas of cortex. Responsible for integrating or acting on info received and processed by sensory areas.

***we use only 10% of our brain**

-association areas=in all four lobes.

-in **frontal lobe**=helps us judge, plan, process new memories

Damaged Frontal lobe=have intact memories. Can bake a cake, but can't plan ahead to BEGIN baking a cake for birthday party

-frontal lobe damage alters personality. Rod blew thru Phineas Gage's head. He used to be soft-spoken, but now irritable, profane, dishonest. Disconnected from his behaviour.

-can become morally deficient-stealing, abusing, etc. don't know right from wrong.

Language:

Aphasia: impairment of language, usually caused by left hemisphere damage to Broca's area (impairing speaking) or Wernicke's area (impairing understanding) CANT TALK PROPERLY. Can speak but can't read, can understand but not talk, can write but not read etc.

Broca's Area: controls language expression, area of frontal lobe usually in left hem that directs muscle movements involved in speech. LANGUAGE EXPRESSION. Sarcasm
-Damage=can't speak but can sing songs and understand speech

Wernicke's Area: controls language reception-brain to understand language and expression. Usually in left temporal lobe.

Damage=only speak meaningless words. Understand but can't form logical sentences.

Angular Gyrus: receives visual info from visual area and recodes it to auditory form, where Wernicke's figures out meaning.

When you read aloud:

1) register visual area

2) goes to angular gyrus to get words into auditory code

3) received and understood by Wernicke's area

4) sent to Broca's which

5) controls motor cortex as it creates and pronounces word.

*complex abilities come from intricate coordination of brain areas

Brain's Plasticity

Plasticity: brain's capacity for modification, as evident in brain reorganization following damage (especially in children) and in experiments on effects of experience on brain development.

- ability to modify itself after some type of damage.
- severed neurons won't regenerate. (spinal cord damaged, u are paralyzed)
- lose a finger and sensory cortex becomes more sensitive for the other fingers.
- piano player=more sensitive auditory cortex that encodes piano sounds.
- blind person uses finger for Braille, that finger part of cortex is more sensitive.
- deaf people use auditory cortex for other sensory info aka visual system.
- amputated hand : if u stroke face he will feel in face and "phantom fingers" ... weird.

Our Divided Brain:

-left hem damage: problems w reading, writing, speaking, math, reasoning, logic, understanding.

-left hem=**dominant hem**

-right hem=**subdominant hem**

Corpus Callosum: large band of neural fibers connecting the two brain hemis and carrying messages between them. Band of axon fibers.

Split Brain: condition where two hemis are isolated bc cutting of connecting fibers (corpus callosum) between them.

-if split brain occurs, people=still normal.

*data received by one hem is quickly transmitted to other across corpus callosum. Person w severed corpus does not share info w other hem.

*if person stares at spot on page w flashing stimulus HE – ART he appears on left visual field (right brain) ART on right field (left brain) person SAYS they see ART bc speech is left brain too. But if they point to the word, they use their left hand (right brain control) and point to HE. Ea hem reports only what it sees.

-split brain=hemis comprehend simultaneously two dif figures w left and right hand. Draw two figures w hands.

*unconscious brain can control our behaviour w/out our conscious effort or will.

-left hem more active when person deliberates over DECISIONS

-right hem understands simple requests, objects, intuitive responses. Drawing, recognizing faces, emotion

Hem Differences in Intact Brain

-if performing perceptual task: brain waves, bloodflow, and glucose consumption are increased in right hem.

-speaks or calculates=increased activity in left hem

-recognize word faster if visualized to left hem

-recognize image faster if flashed to right hem.

Brain Organization:

* **90%** people = right handed

more left handed people are guys than girls

***95%** right handers process speech in left hem.

***over half of lefties** process speech in left hem, but ¼ process language in right hem, other ¼ process w both hem.

-more left handers have migraines and headaches.

-lefties are better than righties in all subjects in iran.

-musicians mathematicians, baseball, cricket, architects, and artists.

-left handers disappear w age.

-left handers are more likely to have experienced birth stress, prematurity or need for assisted respiration. Endure more headaches, have more accidents.

-use more tobacco and alcohol.

-on avg, righties live 8 or 9 yrs longer.

-everything psychological is simultaneously biological.

Roger Sperry: brain creates and controls emergent mind, which then influences brain. (think about bitter lemon, u may salivate)

Chapter 5: Sensation

Sensation: process where sensory receptors and nervous system receive and represent stimulus energies from our environment. (detect physical E and encode it to neural signals. Select, organize, interpret sensations = perception)

Perception: organizing and interpreting sensory info, enabling us to recognize meaningful objects and events. Organizing, interpreting sensations.

Bottom-up processing: analysis that begins w sensory receptors and works UP to brain's integration of sensory info. Look at photo detect angles/lines/colours/background from objects.

Top-down processing: info processing guided by HIGHER LEVEL mental processes, like when we construct perceptions drawing on our experiences & expectations.

-detect aspects of photo that give observations meaning.

Prosopagnosia: losing temporal lobe areas essential to recognizing faces. Incomplete perception. Can see, but cant recognize it.

Thresholds:

Psychophysics: study of relationships between physical characteristics of stimuli, like Intensity, and our psychological experience of them.

Absolute threshold: minimum stimulation needed to detect particular stimulus **50 %** of the time. 50-50 recognition point.

Signal Detection Theory: theory predicting how and when we detect presence of faint stimulus (signal) amid background stimulation (noise). Assumes there is no single absolute threshold and detection depends partly on person's experience, expectations, motivation, and level of fatigue.

*predicts when we detect weak signals "hit or false alarms"

-exhausted parents of newborn still notice faint whimper from cradle but fail to notice other louder unimportant sounds (fire alarm :P lol)

***ability to catch a faint signal diminishes after 30 minutes**

Subliminal stimulation:

Subliminal: below one's absolute threshold for conscious awareness. (we can unconsciously be aware of something we normally wouldn't detect)

-at slightly below our absolute threshold, we will still detect stimulus some of the time.

Priming: activation, often unconsciously of certain associations, thus predisposing one's perception, memory, or response.

*invisible image or word can prime u for later question. Aka flash image of romantic couple or neg scene of dead body and people said it was pos or neg flashes of light even tho they couldn't see image.

Priming effect: sometimes we FEEL what we do not know and cannot describe. Brief stimulus can trigger weak response and CAN be detected by brain scanning.

*lots of info processing happens automatically. Unconsciously

Difference Thresholds: minimum difference between two stimuli required for detection **50 %** of the time. We experience dif threshold as a **just noticeable difference. (jnd)**

-add 10 grams to 100g weight and u detect dif. Add 10g to a **1 kilogram** weight and u wont. Bc diff threshold has not increased.

-dif threshold is not a constant amount but a constant PROPORTION of stimulus. Two stimuli must differ by constant proportion to be perceptible.

Weber's Law: principle that, to be perceived as different, two stimuli must differ by a **CONSTANT MINIMUM PERCENTAGE** rather than constant amount.

-weber's law=rough approximation.

-our thresholds for detecting dif are a roughly constant proportion of size of original stimulus.

Sensory Adaptation: Diminished sensitivity as a consequence of constant stimulation.

-u become used to an unchanging stimulus so u start to ignore it. Nerve cells start to fire **LESS** frequently.

-**BUT** the object doesn't start to disappear from sight if u stare at it, because our eyes are constantly moving.

*if profile is shown on eyes w special instrument so it follows the movement of eye receptors, then when receptors fatigue, image starts to vanish and reappear/disappear in recognizable fragments.

-our perceptions are organized by meanings that our minds share. Sensory adaptation reduces sensitivity so we can focus on CHANGES in environment.

Vision:

Transduction: Conversion of one form of E to another. In sensation, transforming of stimulus E like sights, sounds, smells, into neural impulses for brains to interpret.

Wavelength: distance from peak of one light or sound wave to peak of the next. Electromagnetic wavelengths vary from short blips of cosmic rays to long pulses of radio transmission.

***pulses of electromagnetic E is what hits our eyes. Not colour. Our visual system sees color.**

Electromagnetic spectrum: short gamma waves to narrow bands of visibule light, to long radio transmission.

Hue: dimension of color determined by wavelength of light. (blue, green, pink)

Intensity: amount of E in light or sound wave that we see as brightness or loudness. Determined by **WAVE AMPLITUDE**

***two physical characteristics of light: wavelength shows hue/colour.**

Intensity=brightness loudness. Wave amp.

The eye:

Light enters eye thru cornea: protective surface that bends light to provide focus.

Pupil: adjustable opening in center of eye where light enters.

Iris: ring of muscle just in front of pupil that forms portion of eye around pupil to control size of pupil opening and how much light gets in.

-dilates and constricts to respond to light intensity and inner emotions.

Lens: behind pupil. Transparent structure that changes shape to help focus image on retina

Accommodation: process where eye's lens changes shape to focus near or far objects on retina.

Retina: light sensitive inner surface of eye, contains receptor rods and cones plus layers of neurons to process visual info. Multilayered tissue.

-doesn't read image as whole. Millions of receptors convert light E into neural impulse sent to brain to be perceived as upright image.

*Short wavelength=high frequency. Blue colors, high pitched sounds.

Long wavelength=low frequency. Red colors, low-pitched sounds.

Great amplitude=bright color loud sound

Small amp=dull colors, soft sounds.

Acuity: sharpness of vision

Nearsightedness: see near objects easily. Far objects are focused **IN FRONT** of retina. So blurred.

Farsightedness: see objects clearly. Near objects are focused **BEHIND** retina. Blurred.

Rods: retinal receptors. See black and white and gray. Good for peripheral and night vision. Found on sides of retina.

Cones: retinal receptor cells found in center of retina. For **DAY** vision. Detect detail and give color sensation.

Optic Nerve: nerve that carries neural impulses from eye to brain.

Blind Spot: place where optic nerve leaves eye. "blind" spot bc no receptor cells there.

Fovea: central focal point of retina. Where cones cluster. **ONLY CONES**

*20/20 vision can see material certain size from 20ft away

*rods and cones have light E strike them to generate neural signals. These signals activate **bipolar cells** that activate **ganglion cells**.

*cones have own bipolar cells=detail

*rods share bipolar cells. In dim light, they send combined faint light E into single bipolar cell. =faint light.

In dim light, pupils dilate to let light reach rods on periphery of retina.

*cones=6 million

rods=120 million

Visual Info Processing

retina- processes info before routing it to thalamus and then to brain's cortex. Neural layers that help encode and analyze sensory info.

Retina=130 million receptor rods and cones. Received and transmitted to millions of ganglion cells whose axons make up optic nerve. Shoots info to brain.

-certain retina areas send info to certain locations of occipital lobe.

-even **PRESSURE** triggers retinal cells.

-brain interprets firing as light. Light coming from left is actually activated by right side of retina.

-ganglion axons forming optic nerve run to thalamus and then to visual cortex.

Feature Detection: nerve cells in brain that respond to specific features of stimulus, such as shape, angle, movement.

-temporal lobe: perceive faces.

Parallel Processing: processing of several aspects of a problem simultaneously. Brain's natural mode of info processing for many functions, including vision. Contrasts w step-by-step (serial processing) of most computers and conscious problem solving.

-parallel processing=doing several things at once. Visual scene of color, depth, movement. Recognizing face requires 30% brain power of cortex.

Blindsight: lost portion of brain's visual cortex have blindness in part of field of vision. Cant see sticks in blind field, but if u guess if the sticks are vertical or horizontal, they get the right answer.

Color Vision: tomato is everything BUT red bc it rejects long wavelengths of red.

Young-Helmholtz trichromatic (three color) theory: theory that retina contains 3 dif color receptors, one for red, green, and blue. Which when stimulated combines to produce perception of any color.

Subtractive color mixing: subtracts wavelengths from reflected light. More colored paints u add, less wavelengths can be reflected back. PAINT MIX=BLACK

Additive color mixing: mixing lights, increases light, makes white. LIGHT MIX=WHITE

Colorblind: u don't have a working red or green sensitive cone. (or both) (**monochromatic**)

Dogs: dichromatic: don't have red receptor

Norm: trichromatic

Afterimages: when u stare at green square then at white paper u see red. The **opponent color**

-stare at yellow, u see blue.

Green w red / blue w yellow

Opponent Process Theory: opposing retinal processes (red-green, yellow-blue, white-black) enable color vision. For ex. some cells are stimulated by green and inhibited by red. Others are stimulated by red and inhibited by green.

-some neurons are turned ON by red but OFF by green

*when we tire out our green response by staring at green, then stare at white, the red part of green-red pairing starts to fire normally (bc white contains red)

*retina's red, green, blue cones respond in varying degrees to dif color stimuli, like 3 color theory.

-their signals are then processed by nervous system's opponent process cells, on way to visual cortex.

Color Constancy: perceiving familiar objects as having consistent color even if changing illumination alters wavelengths reflected by object. (same color dot looks like its different colors of blue depending on shade of color around it)
-experience of color comes from surroundings as well.

Hearing

Audition: sense or act of hearing. We hear best at frequencies in range of human voice.

Stimulus Input: Sound Waves

Frequency: number of complete wavelengths that pass a point in a given time (per second)

Frequency determines Pitch

Pitch: tone's experienced highness or lowness.

Long wave=low frequency=low pitch

Short wave=high frequency=high pitch

Decibels: measuring unit for sound E. absolute threshold for hearing is arbitrarily ZERO. Over 85 decibels =hearing loss.

The Ear

Outer Ear: channel to eardrum (tight membrane)

Middle Ear: chamber between eardrum and cochlea containing 3 tiny bones (hammer, anvil, stirrup) that concentrate vibrations of the eardrum on cochlea's oval window.

Inner Ear Cochlea: coiled, bony, fluid-filled tube in inner ear where sound waves trigger nerve impulses. Snail shaped.

Cochlea membrane=oval window.

Inner Ear: innermost part of ear containing cochlea, semicircular canals, vestibular sacs.

Cochlea has basilar membrane lined with **hair cells** filled w **fluid**. rippling of basilar membrane bends hair cells that trigger impulses in nerve fibers that converge to form auditory nerve.

-sound waves cause hair cells of inner ear to send neural message via thalamus to temporal lobe auditory cortex.

Cochlea has 16000 hair cells.

*pressure change in cochlear fluid causes basilar membrane to ripple.

***Brain interprets loudness from NUMBER of activated hair cells.**

***Really loud sounds may seem loud to people with hearing loss OR normal hearing.**

Perceiving Pitch

Place Theory: Hermann von Helmholtz's theory that links pitch we hear with place that's stimulated on cochlear membrane.

-high frequencies produce large vibrations near beginning of cochlea's membrane, low frequencies near the end.

-does NOT explain how we hear low-pitched sounds.

Frequency Theory: hearing rate of nerve impulses traveling up auditory nerve matches frequency of a tone, enabling us to hear pitch. If sound wave=frequency of 100 waves/sec, then 100pulses/sec travel up auditory nerve.

-does NOT explain how we sense sounds w frequencies above 1000 waves/sec bc neurons cant fire faster than that.

Volley Principle: neural cells can alternate firing. By firing in rapid succession, they can get combined frequency over 1000.

Hearing loss and deaf culture

Conduction Hearing Loss: hearing loss caused by damage to mechanical system that conducts sound waves to cochlea.

Eardrum punctured, tiny bones of middle ear cant vibrate.

Sensorineural hearing loss: hearing loss caused by damage to cochlea's receptor cells or to auditory nerves. Called Nerve deafness. (linked to age, heredity, prolonged exposure to ear-splitting noise. Once destroyed, tissue=dead)

*old people hear low frequencies but have trouble w high frequencies.

-digital hearing aids improve hearing by amplifying vibrations for frequencies.

-compressing sound (amplifying soft sounds but NOT loud sound)

Cochlear Implant: electronic device for converting sounds into electrical signals and stimulating auditory nerve thru electrodes threaded into cochlea.

Sensory Compensation: if deaf, regions normally dedicated to visual and auditory inputs are available for other uses, like discriminating touch sensations.

Touch: mix of pressure, warmth, cold, pain.

-only PRESSURE has identifiable receptors.

-brain is most sensitive to other person's stimulation.

-top-down influence of touch sensation=touch fake hand and real hand, u think the rubber hand is ur hand.

Pain:

Phantom limb sensation: brain misinterprets spontaneous central nervous system activity that occurs in absence of sensory input.

Tinnitus: hearing ringing in ears sensation.

-pain producing brain activity may be triggered w or w/out sensory input.

Gate Control Theory: spinal cord contains a neurological "gate" that blocks pain signals or allows them to pass on to brain. Gate is opened by activity of pain signals traveling up small nerve fibers and is closed by activity in larger fibers or by info coming from brain.

-spinal cord has small nerve fibers that conduct most pain signals, but larger fibers that conduct most other sensory signals.

-when tissue is injured, small fibers activate and open neural gate. Large fiber activity closes off pain gate. So u can get rid of pain by distracting the small fibers by using big fibers.

-distracted from pain and soothed by release of endorphins.

***Brain creates pain. Not just a physical phenomenon.**

-memories of pain=remember pain worse than actual experience.

-remember at peak moment.

Daniel Kahneman: if u keep hand under cold water and stop abruptly, experience is worse, than if u hold under cold water, then for longer under slightly less cold water.

Taste: chemical sense. Inside ea little bump on top and sides of tongue=200 or more taste buds. Ea contain pore that catches food chemicals. Molecules sensed by 50-100 taste receptor cells that project antennalike hairs into pore.

-taste receptors reproduce every week or two. If u burn ur tongue, doesn't really matter.

-AS U GET OLD, u lose taste buds and taste sensitivity.

-smoking and alcohol accelerate decline of taste buds and sensitivities.

Linda Bartoshuk: found out emotional response linked to taste. Bitter taste on new baby=same as adult

-people w no tongue can STILL taste bc receptors on back of mouth.

-middle of tongue has few taste receptors, we think taste comes from whole tongue.

Sensory interaction: principle that one sense may influence another, like smelling food influences its taste. Enhances it.

McGurk Effect: ba ba ba da ba ba ba if u see a speaker say one syllable but hear the other, u might perceive a third syllable and think GA . **harry mcGurk and assistant John MacDonald**

-brain can combine simultaneous visual and touch signals, thanks to neurons projecting from somatosensory cortex back to visual cortex.

Synaesthesia: seeing a sound, hearing a color.

Smell: olfaction

-smell = chemical sense

-smell w molecules of substance carried in air reaching cluster of 5 million receptor cells at top of nasal cavity.

-odor to olfactory receptor cells to axons to higher regions of brain in temporal lobe to limbic system involved in memory and emotion.

***cannot separate odor into elemental odors**

-olfaction system has no parallel to retina that detects myriad of colors w sensory cells dedicated to red, green, or blue.

-olfactory receptors recognize odors individually.

-odor molecules come in many shapes and sizes.

-some odors trigger combo of receptors that olfactory cortex interprets.

-attractiveness of smell depends on learned associations.

-odors can cause unpleasant emotion

-pleasant odors cause pleasant memories.

Kinesthesia: system for sensing position and movement of individual body parts.

Vestibular System: sense of body movement and position, including sense of balance.

-semicircular canals which look like 3D pretzels and vestibular sacs connect canals w cochlea contain fluid that moves when head rotates or tilts. Movement stimulates hairlike receptors sending message to cerebellum to give balance.

-pain=response to info traveling both Up spinal cord's small nerves and DOWN what our mind is paying attention to.

Chapter 6: Perception

Bottom-up: sensation. Detect physical E. encode it as neural signals.

Top-down: organize/interpret sensations. **Perception.**

Selective Attention: any moment, our awareness focuses like a flashlight beam only for limited aspect of what we experience.

-focusing of conscious awareness on particular stimulus. As in cocktail party effect

cocktail party effect: ability to attend to only one voice among many. (hear ur name out of a bunch)

Inattentional blindness: failing to see visible objects when our attention is directed elsewhere. (woman walks across screen in middle of fight, but people don't see woman bc they are focused on fight) **Change blindness**

Change Deafness: 40% of people focused on repeating list of words and failed to hear a change in person talking.

Choice Blindness: Peter Johansson noticed people don't know if person they chose before to be beautiful is same person they are shown again.

Pop-Out Phenomenon: distinct stimulus (simley face in a bunch of sad faces) demands our attention.

Illusions: deceives ur mind.

Visual Capture: tendency for vision to dominate other senses. Vision usually WINS

Gestalt: an organized whole. Gestalt psychologists emphasized our tendency to integrate pieces of info into meaningful wholes.

-we perceive objects as distinct from their surroundings.

Organize sensation into perception.

-perception exceeds the sum of its parts.

(combine sodium w chlorine, two poisonous things, but u get table salt)

-putting together visual features=bottom up processing to take in sensory analysis and top down processing to use experiences and expectations to interpret sensation.

Figure-ground: organization of visual field into objects (figures) vs ground (surroundings). Objects stand out from surroundings.

-first perceptual task=background vs objects

Grouping: perceptual tendency to organize stimuli into coherent groups. Bring order to basic sensations like color, movement, light/dark contrast.

-perceived whole differs from sum of parts.

Grouping:

Proximity: group nearby figures together. See 3 groups of 2 lines not 6 separate lines.

Similarity: group figures that are similar to ea other. Vertical columns of similar shapes.

Continuity: see smooth continuous patterns rather than discontinuous ones (two continuous lines-one wavy one straight)

Connectedness: uniform and linked. We see two dots and line between them as single unit. ._. connected

Closure: fill in gaps to create a complete whole object.

Depth Perception: ability to see objects in 3D even tho images strike retina on 2D. allows us to judge distance.

Visual Cliff: lab device for testing depth perception in infants or animals. (young) **Gibson and Walk**

-ea species by the time it can walk has perceptual abilities and needs. (glass covered table to look like u will fall off.)

Binocular Clues: in judging distance of nearby objects, two eyes are better than one.

-depth cues, such as retinal disparity and convergence, that depend on use of two eyes.

*bc our eyes are 2.5 in apart, our retinas receive slightly dif images of world. Brain compares the images and makes dif between them (**retinal disparity**) to give u important cue to relative distance of dif objects.

Retinal Disparity: binocular cue for perceiving DEPTH. By comparing images of two eyeballs, brain computes distance... greater the disparity, (difference) between the images, the closer the object.

-3D movie makers simulate or exaggerate retinal disparity by photographing a scene w two cameras placed a few inches apart.

Convergence: binocular cue for perceiving depth. Extent to which eyes converge inward when looking at an object. Greater the inward strain=closer the object.

-neuromuscular cue caused by eye's inward turn when they look at close objects.

Monocular Cues: depth cues, like interposition and linear perspective, available to either eye alone.

Relative size: similar in size=one casts smaller retinal image is the one further away

Interposition: if one object partially blocks another from view, it is closer.

Relative Clarity: hazy objects look further away. Sharp clear objects=close.

Texture gradient: coarse and distinct=close, indistinct fine=far. Objects far away appear smaller and more densely packed.

Relative height: objects higher up in field=vision further away.

-tall glass looks like it has more liquid in it than actually does.

Relative motion (motion parallax) as we move, objects that are actually stable look like they move.

-if on a bus, and u fix ur gaze on an object, objects closer than the house seem to move backwards (house=fixation point)

-objects beyond fixation point appear to move w you. Further away those objects are, faster they move.

Linear perspective: parallel lines (railroad tracks) appear to converge w distance. More the lines converge, greater distance.

Light and shadow: dim=far away. Bright=close.

Motion perception

-brain says motion is based on shrinking objects move away, enlarging objects are approaching.

*if u keep a baseball at a constant angle of gaze, a fielder will run thru the point of its return as it arrives.

Stroboscopic movement: brain perceives continuous movement in a rapid series of slightly varying images. (flashing pictures)

Phi phenomenon: when two adjacent stationary lights blink on and off really fast we think it's a single light moving back and forth between them.

-illusion of movement created when 2 or more adjacent lights blink on and off quickly.

Perceptual constancy: perceiving objects as unchanging (having consistent lightness, color, shape, size) even as illumination and retinal images change.

-looking at a door and still knowing it's a door even though its either open or closed and shape changes. (top down processing)

Shape constancy: perceive form of familiar objects as constant even if retinal images change.

Size constancy: still know that a car that is far away looks small but can hold people.

Size distance relationship: Muller-Lyer illusion

-Richard Gregory shows corners of line either up or down make it look like a longer line than a smaller line. But if u measure them, they are same length.

-culture and perception: people who live in Africa don't have rectangular buildings. Less likely to be susceptible to Muller-Lyer illusion.

Lightness Constancy: (brightness constancy) we perceive an object as having constant brightness even if illumination varies.

Relative luminance: amount of light an object reflects relative to its surroundings.

-if u look at black paper in sun through a narrow tube, it might look gray bc sun reflects a fair amount of light. If u just look at paper, it looks black bc it reflects much less light than objects around it.

Color constancy: as light changes, red apple in fruit bowl looks more red bc our brain says light reflected by any object is relative to its surrounding objects.

THE DOGATEMEAT . we see this as organization into words AND interpretation: giving meaning to what we perceive.

Sensory Deprivation: person that used to be blind could not recognize sight objects that were familiar by touch.

-people deprived of visual experience during infancy are better at recognizing PARTS or seeing half of two images is the same.

-we perceive normally things as WHOLE.

-Molyneux experiment: put goggles on animals that could only see unpatterned light. After infancy, and goggles removed, animals had limited perceptual abilities.

-they could see color and brightness, but not the form of a circle vs a square. BLIND TO SHAPE.

-sensory restriction is not harmful if it happens LATE in life.

Critical Period: normal sensory and perceptual development.

-if kids have cataracts and they aren't removed, then they will lose ability to perceive shapes.

Perceptual Adaptation: in vision, ability to adjust to an artificially displaced or even inverted visual field.

-experiment with **George Stratton**

-can adapt and coordinate new movements.

Perceptual Set: mental predisposition to perceive one thing and not another.

-once we form a WRONG IDEA we have more difficulty seeing the truth.

Schemas: organize and interpret unfamiliar information. Thru experience we form concepts. Interpret sensation=top down.

-what is important to us. 4 yr old draws faces w stick legs showing that schemas of reality=face=important.

Christopher Tyler: found artists try to capture sense of person by putting one eye on centerline.

Peter Thompson: found face recognition is especially attuned to expressive eyes and mouth.

-sometimes people recognize caricature better than actual.

Context Effects: the brain can work backwards in time to allow later stimulus to determine how we perceive an earlier one.

Human Factors Psychologists: branch of psyc that explores how people and machines interact and how machines and physical environments can be made safe and easy to use.

-design stove controls than don't need labels bc of mapping out (**natural mapping**)

human factor in misperception: no distance cues when coming to runway over dark surface, pilots have trouble landing and fly "too low".

*designers and engineers should consider human factor, by designing things to fit people. Put user-testing inventions before production and distribution.

Extrasensory Perception: (ESP): controversial claim that perception can occur apart from sensory input. Said to include "telepathy, clairvoyance, and precognition)

Telepathy: mind to mind communication

Clairvoyance: perceiving remote events like sensing that a friend's house is on fire

Precognition: perceiving future. Know which team will win

Psychokinesis: being able to move things w ur mind. "mind over matter". "all those in favor of psychokinesis please raise my hand"

-premonitions and pretensions: not reliable.

-of course the more predictions made, the bigger the chance one of them is right.

-scientific attitude says parapsychology needs to give its credibility as a reproducible phenomenon and theory to explain it.

-on stage, psychic controls what audience sees and hears

-James Randi: skeptic who offers 1 million dollars to anyone who proves a genuine psychic power under proper observing conditions.

-first steps to processing info is receiving sensory input and making meaningful perceptions.

Chapter 7: States of Consciousness

By 1960s, psyc no longer defined as study of consciousness or "mental life" but rather "science and behaviour"

Consciousness: our awareness of ourselves and environment.

-brings info to surface. Allows us to reflect and plan.

-enables us to exert voluntary control and communicate mental states to others.

-we register and react to stimuli we do not consciously perceive.

-occurs in normal states of seeing, hearing, reasoning, remembering. Also exists in altered consciousness of sleep, hypnotic states, and chemically induced hallucinations.

-we process info on **two levels:** conscious processing is serial and slow. But focused state of awareness enables us to perform voluntary acts. Unconscious processing we perform familiar tasks automatically and sensory systems and neural pathways register stimuli rapidly and simultaneously on multiple tracks (parallel processing)

Stephen Kosslyn & Olivier Koenig: think brain events are to consciousness as guitar's individual notes are to chord.

Benjamin Libet: observes we experience chord in instant AFTER all notes are present. So consciousness is LAG behind brain events that evoke it.

-unconscious info processing: occurs simultaneously on multiple parallel tracks

conscious processing: takes place in sequence (SERIAL processing)

-consciousness=slow. Limited capacity. Still skilled.

Sleep and Dreams

Biological Rhythms: periodic physiological fluctuations.

Annual Cycles: occur once a year. Humans=seasonal appetite. Geese migrate.

28 day cycle: female menstrual cycle. Some people think it causes mood fluctuation. **Cathy McFarland** did not notice mood difference in menstrual cycle.

24 hour cycle: sleep. Varying alertness, body T. growth hormone secretion.

90 minute cycle: stages of sleep (REM) small animals have shorter sleep cycles.

Rhythms of sleep

Circadian Rhythm: biological clock; regular bodily rhythms (for ex. T and wakefulness) that occur on 24 hour cycle.

-day and night biological clock. Body T rises as morning comes, peaks during day, drops before we go to sleep.

-midday=body energized (fret less)

-feel groggiest at 4 AM . second wind when normal wake up hour arrives.

-think sharpest and best memory at daily peak in circadian arousal

-young=energy increase over day

-old=energy decrease over day

Suprachiasmatic nucleus: tiny neural center IN HYPOTHALAMUS that sits above optic nerve. Sends "light" signals to **pineal gland**.

Suprachiasmatic nucleus= pair of 20 000 cells (pinhead sized clusters) that control circadian clock. Tells pineal gland to decrease (morning) or increase (night) secretion of **melatonin**

Asleep=brain has more melatonin

Awake=brain has more adenosine which inhibits certain neurons, making u sleepy.

***artificial light delays sleep**

Sleep Stages: sleep overtakes us at dif parts of cortex to stop communicating. Consciousness fades.

-still active sleeping brain has 90 minute cycles of five distinct sleep stages.

REM sleep: rapid eye movement sleep, a recurring sleep stage when VIVID DREAMS occur. "paradoxical sleep" bc muscles are very RELAXED. Except for minor twitches. But other body systems are active.

*measure sleep w **electrodes**

Alpha Sleep: relatively slow brain waves of relaxed, AWAKE, state.

Sleep: periodic, natural reversible loss of consciousness-as distinct from unconsciousness resulting in coma, general anesthesia, or hibernation.

-marked by slowed breathing, irregular brain waves of stage one.

Alpha=awake

Stage 1: irregular EEG waves, slowed breathing. Happens in an unremembered moment.

During stage one: Hallucinations: false sensory experiences, such as seeing something that isn't actually there. (no visual stimulus)

Hypnagogic sensations: later incorporated into memories.

Stage 2: 20 minutes long. Periodic appearance of **sleep**

spindles: bursts of rapid rhythmic brainwave activity.

-u can still be awakened w/out much difficulty. Clearly asleep

-SLEEP TALKING (garbled nonsense. Happens now or at any other stage.)

-50% of sleep

Stage 3: transition stage to stage 4.

-start of **Delta Waves. (mostly in stage 4)**

Stage 4: Delta waves: large slow brain waves associated with deep sleep.

-30 minutes long (combined stage 3&4)

*at end of stage 4, kids wet the bed. Or sleep walk.

-u can still be aware of certain stimuli in sleep. Move around in bed, but wont fall out.

-sleep w baby but not suffocate them (if not intoxicated)

-passing vehicles doesn't disturb u but crying baby does.

-EEG shows brain's AUDITORY cortex responds to sound stimuli even when sleeping.

-process info outside of conscious awareness.

***hour after u fall asleep, u ascend from initial sleep dive.**

Go back to stage 3 and 2

THEN REM

REM sleep: looks like alpha waves and looks like u are awake (but u aren't. deepest form of sleep. Can't be awakened)

-after stage 2 (second time at stage 2) lasts **10min**

-FIRST CYCLE of REM=10min long.

-looks like alpha.

-heart rate increases, breathing rapid, irregular,

-ea 30 seconds ur eyes dart around

-genitals are aroused during REM (unless scary dreams)

-erection or increased vaginal lubrication and clitoral

engorgement. Regardless of sexual dream content.

-"morning erection" =remains from last REM period just before waking.

-*typical 25yold man=erection for **half** night's sleep

*65yr old man=**1 quarter** of night.

Erectile dysfunction (impotence) : if men still have morning erections, problem isn't w erection, its w depression mbe.

-motor cortex=active during REM

-brainstem blocks motor messages leaving muscles relaxed

except for some twitches. (REM=paralyzed)

REM=internally aroused, externally calm. Paradoxical

REM=**beginning of a dream. Storylike, richly hallucinatory**

REM=visual and auditory brain areas still active but inactive in other stages.

-cycle repeats **every 90 minutes**

STAGES: 1-2-3-4-3-2-REM

-more REM after 1st hour, less stage 4. REM gets LONGER

-by morning, 20-25% of avg sleep (100min) =REM

NO SNORING IN REM

Why do we Sleep?

-not everyone needs 8 hrs.

-babies=2/3ds of day sleeping

-adults=less than 1/3

-sleep patterns=mbe genetically influenced.

-culturally influenced. Industrialized nations sleep less than a century ago.

-if allowed, humans sleep 9hrs. don't become groggy.

Effects of sleep deprivation

- teens need 8-9 hrs of sleep which is 2hrs less than what we used to get 80 yrs ago.
- sleep deprivation experiments show SLOW REACTION TIMES and INCREASED ERRORS on visual tasks like airport bag screening, surgery, reading X-rays.
- sleep deprivation can be DEVASTATING for driving and pilot
- sleep loss affects **immune system** that helps fight disease
- people who sleep 7-8hrs a night outlive those who are sleep deprived.
- older adults who have no difficulty falling asleep live longer.
- when we are sick, we sleep more.
- chronic sleep debt alters metabolic and hormonal functioning. Promotes obesity, hypertension, memory impairment.**
- sleepy frontal lobe=unexpected situation. Problem.

Sleep Theories: 4 theories

- 1) protection:** sleep in cave=protect from animals
 - elephants=3-4 hrs /day cats=14hrs/day
 - chipmunk/bat=20hrs
- 2) Sleep helps recuperate: restore and repair** brain tissue
 - sleeping gives resting neurons time to repair themselves
 - allows unused connections to weaken.
- 3) remembering:** restores and rebuilds fading memories of day's experiences. People training in tasks recall better after good night's sleep.
 - SlowWaveSleep =reenacts and promotes recall of experience
- 4) Growth process:** PITUITARY gland releases growth hormones.

Sleep Disorders:

Insomnia: recurring problems in falling asleep or staying asleep.

- true insomnia=inability to sleep
- insomnia people overestimate problem by **double** how long it actually took them to get to sleep.
- underestimate how long they slept
- alcohol and some pills **REDUCE REM**
- if u increase dosage, people can get worse insomnia later

Narcolepsy: Sleep disorder where u have uncontrollable sleep attacks. The sufferer lapses into REM (lol) often at inopportune times (writing an exam. World baseball)

- lasts less than 5 minutes.
- severe cases=person goes into brief period of REM and has muscular tension loss.

-1 in 2000 people have it

- happens when u are swinging at baseball, exam, sex, laughing loudly, shouting angrily.

Sleep Apnea: temporary cessations of breathing during sleep and repeated momentary awakenings.

- happens to overweight men.

-1 in 20 people get it.

- stop breathing during sleep. After no oxygen for a minute or two, decreased blood flow to head causes sleeper to wake up and SNORT for air.

-can happen 400 times a night.

- LOUD SNORING

Night Terrors: high arousal and appearance of being terrified. UNLIKE nightmares, happens in **stage 4** of sleep, w/in no more than 3 hrs of falling asleep. Seldom remembered.

-night terrors during first few hours of stage 4 sleepwalking=stage 4 disorder. Runs in families.

- young children=most likely to sleepwalk**
- ***night TERROR = w/in 2 or 3 hrs of falling asleep in stage 4.**
- ***night MARES= toward morning, during REM**

Dreams

- REM DREAMS:** sequence of images, emotions, thoughts in sleeper's mind. Dreams have hallucinatory imagery, discontinuity, and dreamer's delusional acceptance of content and later hard to remember.
- contain familiar detail.**
- lucid dreamer:** in a dream and aren't sure if u are really dreaming.

- women dream of men and females equally
- men dream of 65%men

Manifest Content: according to FREUD, remembered story line of a dream (distinct from latent, or hidden content)

Latent Content: According to FREUD, the underlying meaning of a dream (distinct from manifest content) Freud believed that dream's latent content was a safety valve.

- if anything happens 5 minutes into falling asleep, u typically lose memory.

Why we dream

- To satisfy our own wishes.** Freud thought that dreams are a psychic safety valve that gets rid of unacceptable feelings. "manifest content" is a censored symbolic version of "latent content"

-To file away memories:

Information Processing: researchers think dreams help sift/sort/fix/ days experiences.

REM facilitates memory

- *if u are woken up every time u fall into REM, u remember LESS the next day.
- after 2 nights of recovery sleep, slow wave sleep and REM sleep don't do well on test as much as undisturbed do on new learning.
- we have REM to remember.
- deep SWS sleep helps stabilize memories of experiences. REM helps convert memories to LONG TERM learning.**

- To develop and preserve neural pathways:** dreams serve a physiological function.

- dreams associated brain activity of REM provide sleep w periodic stimulation.

-preserves brain neural pathways

- infants spend great deal of time in REM**

- make sense of neural static:** dreams come from neural activity that spreads upward from brainstem

Activation synthesis theory: neural activity is random, dreams are brain's attempt to make sense of it.

- internal stimuli activate brain areas that process visual images but not visual cortex area, which receives raw visual stimulus.

- PET scans show increased activity in emotion limbic system (amygdala during REM)

- frontal lobe=idel

- to reflect cognitive development: dreams=brain maturation and cognitive development.
- before age9, children's dreams=slide show. Active story when dreamer=actor.
- dreams have coherent speech, concepts of knowledge.
- some dream images appear outside REM.

We NEED REM

REM Rebound: tendency for REM sleep to increase following REM sleep deprivation (created by repeated awakenings during REM)

- withdrawing REM suppressing medications increases REM but bring nightmares.
- REM is BIOLOGICAL NEED

Hypnosis: social interaction where one person (hypnotist) suggests to another (subject) that certain perceptions, feelings, thoughts, or behaviours will spontaneously occur.

-**Austrian physician Anton Mesmer:** thought he had discovered "animal magnetism" passed magnets over bodies of ailing people, some who woke up in trancelike (mesmerized) state much improved. (found not true)

-power of hypnotist is in openness and suggestiveness of subject. Hypnotists have no magical mind-control power. They engage people's ability to focus.

-**Stanford Hypnotic Susceptibility scale:** easy to difficult exercises that tell person if they are easily hypnotized.

-20%people=highly hypnotizable. Imaginative

-**hypnotic ability:** ability to focus attention totally on a task, and imaginatively become absorbed in it.

-**Age Regression:** ability to relive childhood experiences.

Martin Orne & Frederick Evans: demonstrated hypnotized people COULD be induced to perform dangerous act.

-act against will.

-all **unhypnotized people** did the same acts as hypnotized. Therefore, hypnosis does NOT cause people to act against will.

Posthypnotic suggestions: suggestion, made during hypnosis session, to be carried out after subject is no longer under hypnosis. Used by some clinicians to help control undesired symptoms and behaviours (smoking, alcoholic)

-70% improvement.

Hypnosis CAN relieve pain

-reduces fear, hypersensitivity to pain. 10% of us can be so deeply hypnotized that surgery can be performed.

Dissociation: a split in consciousness, allows some thoughts and behaviours to occur simultaneously w others.

-hypnosis takes pain stimulus away from sensation.

-hypnotic pain relief results from selective attention

-PET scans show hypnosis reduces brain activity in region that processes painful stimuli, but not in sensory cortex that receives RAW sensory input.

-**hypnosis does NOT block sensory input, just attention to those stimuli.**

-**Lamaze method:** childbirth method using breathing and concentration to take attention away from pain.

Hypnosis an altered state of consciousness?

-skeptics think hypnosis is power of social influence

Social influence theory: think hypnosis phenomena are NOT unique to hypnosis.

-hypnotized subjects SOMETIMES carry out suggested behaviors on cue, even when they think no one is watching.

-deeply hypnotized people=asked to imagine color, areas of brain light up as if seeing actual color.

Ernest Hilgard: hypnosis involved not only social influence, but also special state of dissociated (divided) consciousness.

-thought hypnotic dissociation is vivid form of everyday mind splits.

-

Divided consciousness theory: hypnosis caused a split in awareness

Social Influence theory: subject is so caught up in hypnotized role, they ignore ammonia odor.

John Kihlstrom & Kevin McConkey: believe in both social influence AND everyday dissociations between conscious awareness and automatic behaviour.

Drugs & Consciousness

Psychoactive Drugs: a chemical substance that alters perceptions and mood.

Tolerance: diminishing effect w regular use of same dose of drug, requires user to take larger and larger doses before getting same effect.

Withdrawal: discomfort and stress after stopping usage of addictive drug

Physical Dependence: physiological need for a drug. Marked by unpleasant withdrawal symptoms after drug discontinued

Psychological Dependence: psychological need for drug. Used to relieve neg emotions.

Addiction: compulsive drug craving & usage

Misconceptions about addiction

1)**Addictive drugs quickly corrupt:** people don't actually normally become addicted when using drugs medically.

-given morphine to control pain, does not start addict.

2)**Addictions cannot be overcome voluntarily: therapy required:** people CAN do it on their own.

3) **We can extend concept of addiction to cover not just drug dependencies but whole spectrum of repetitive pleasure seeking behaviours:** even though behaviors seem like addictions, they are really just impulse behaviors.

Psychoactive Drugs: Depressants, Stimulants,

Hallucinogens: all work on brain SYNAPSES by stimulating, inhibiting, or mimicking activity of NT's.

Depressants: Drugs (alcohol, barbiturates (tranquilizers), and opiates) that reduce neural activity and slow body functions.

Alcohol: Alcohol is a DEPRESSANT at small or large dosages -alcohol causes people to have lively "spirits" by inhibiting judgement and slowing brain activity.

-make people more aggressive.

-make people more willing to help

-increases harmful tendencies. (taking advantage of sex)

-increases helpful tendencies-give big tips

low dosage relaxes drinker by slowing sympathetic (arousal) nervous system activity.

-larger doses=slow reaction, slur speech, skilled performance deteriorates.

-disrupts process of long term memories

-SUPRESSES REM

- causes brain shrinkage (shown on MRI)
- girls and young women=easily addicted compared to boys/men
- suffer more lung, brain, liver damage
- reduces self-awareness
- focuses attention on immediate situation and not future consequence

David Abrams and Terence Wilson: found after shown erotic movie clip, men who THOUGHT they consumed alcohol reported having sexual fantasies and being guilt-free. Attributed sex response w alcohol releasing inhibitions. Even if they had no alcohol.

Barbiturate: drugs that depress the activity of central nervous system, reducing anxiety but impairing memory and judgment.

-tranquilizers

- mimic effect of alcohol. Depress nervous system, (Nembutal, Seconal, Amytal) used medically to induce sleep or reduce anxiety. Larger doses, lead to impaired memory or judgment.
- can cause death

Opiates: opium and its derivatives (morphine & heroin) depress neural activity, temporarily lessening pain and anxiety.

- pupils CONSTRICT. Breathing slows, user becomes lethargic.
- few hours of blissful pleasure, after=pain and anxiety
- short-term pleasure =long term price. Bc craving for another fix.
- brain stops producing its own opiates, (endorphins) extreme discomfort w withdrawal.

Stimulants: drugs (caffeine, nicotine, and more powerful amphetamines, cocaine, ecstasy) that EXCITE neural activity and speed up bodily functions.

- substances to stay awake, lose weight, boost mood or athletic performance.

-CAFFEINE, nicotine, cocaine, ecstasy

Amphetamines: STIMULANTS, that stimulate neural activity, cause speeded up body functions associated E and mood changes.

Methamphetamine: powerfully **addictive** drug that stimulates central nervous system, w speeded up body functions and associated E and mood changes; over time, appears to reduce baseline **dopamine levels. DECREASES DOPAMINE**

-methamphetamine causes 8 hours or so of heightened E and euphoria (related to release of dopamine.

- causes irritability, insomnia, hypertension, seizures, periods of disorientation, occasional violent behaviour.

-HIGHLY ADDICTIVE

-“speed”=chemically related to amphetamine.

***all strong stimulants increase heart, and breathing rates.**

Cause pupils to dilate, appetite to diminish (bc blood sugar increases) E and self-confidence to rise.

***all stimulants** can be **ADDICTIVE** and cause **CRASH** after, and fatigue, irritability, headaches, depression.

Cocaine: “crack”=smoked

“free-based” =snorted cocaine injected.

- enters bloodstream quickly.

-STIMULANT

-ADDICTIVE

-5-30minute rush of euphoria before crash.

-depletes brain’s supply of NT’s **dopamine serotonin, and norepinephrine**

-crack is faster than cocaine, (smoked) produces briefer intense high, more intense crash.

-depression after drug wears off.

-craving goes away for several hours, returns several days later.

-emotional disturbance, suspiciousness, convulsions, cardiac arrest, respiratory failure.

-increase aggressive behavior.

-cocaine gets sucked up in **reuptake** process.

-given placebo, people who “think” they’ve been given cocaine often act like they are on it.

Ecstasy: MDMA. Synthetic stimulant and **mild hallucinogen.**

Produces euphoria and social intimacy, but w short-term health risks and longer term harm to **serotonin producing neurons** and mood and cognition.

-triggers release of dopamine

-MAJOR EFFECT=releases stored serotonin and blocks reabsorption, prolonging serotonin’s feel-good flood.

-club drug. Beginning in first half hour after taking ecstasy pill, for next **3-4 hours** u have emotional elevation, social feelings of connectedness “I LOVE YOU” .

-dehydration, combined w dancing=overheating, increased blood pressure, death.

-brain leached of serotonin and damage to serotonin producing neurons. Leads to reduced serotonin levels . depressed mood

-Ecstasy interferes w serotonin’s control of circadian clock. (disruption of sleep)

-SUPRESSES IMMUNE SYSTEM.

Hallucinogens: psychedelic “mind manifesting” drugs like LSD, that distort perceptions and evoke sensory images that aren’t actually there and no sensory input.

-LSD, MDMA (Ecstasy)

-mild=marijuana

-LSD: powerful hallucinogenic drug. Also known as **ACID**

-Albert Hofmann, creator of LSD took first acid trip. After accidentally ingesting some of the chemical. Reported hallucination.

-LSD is chemically similar to NT **serotonin.**

-emotions of LSD trip vary. Sometimes **WONDERFUL,**

sometimes **TERRIBLE=PANIC** euphoria to panic

-person’s current mood and expectations color LSD experience.

-simple geometric forms, lattice, cobweb, spiral

-next phase=more meaningful images; tunnel, funnel, replays of emotional experiences.

Marijuana: THC: major active ingredient in marijuana;

triggers variety of effects, including mild hallucinations.

-smoked or eaten: THC produces effects difficult to classify

-smoking=drug to brain in 7 seconds

-eating=slower unpredictable rate

-relaxes, disinhibits, euphoric high

-mild hallucinogen. Amplifies sensitivity to colors tastes and smells.

-if person=anxious or depressed, drug might enhance it

-can be used as medication.

-impairs motor coordination, perceptual skills, reaction time necessary for safely operating automobile

- disrupts memory formation. Interferes w immediate recall of info learned minutes before.
- THC lingers in body for month or more
- emotions tend to produce opposing emotions that linger after original emotions disappear.

Influences on Drug Use

- drug use in North American youth increased during 1970s
- after 1990s, cultural antidrug voice softened, drugs increased again.
- some people may be biologically vulnerable to alcohol**
- boys who at age 6 r excitable, impulsive, and fearless, are more likely as teens to smoke, drink, and use other drugs.
- Dopamine Reward Circuit:** addictive chemicals like cocaine, alcohol, and heroin commandeer reward circuit and boost its activity.
- as tolerance develops, drug no longer lifts from one normal to euphoria; it merely lifts circuit from depression to normal!!!!

Psychological and social-cultural influences

- cities=more opportunities
- school dropouts=life meaningless=drugs
- unmarried adults leave home. Alcohol & drug increases. Marry and have kids, decreases
- failure and depressed
- girls w history of depression/eating disorders/sexual/physical abuse. Risk of substance addiction
- cope w depression/anger/anxiety/insomnia
- peer influence
- adolescents **believe** thief friends are doing it and overestimate.
- 14% believed their friends had smoked, tho only 4% acknowledged to doing it.
- drinking dominates bc students overestimate that other friends like it.
- teens from happy families don't do drugs bc they aren't associated w those who do.
- soldiers that were drug addicted in Vietnam stopped after coming home

3 possible ways to influence drug prevention

- 1) education
- 2) efforts to boost self-esteem
- 3) train refusal skills

Near Death Experiences: an altered state of consciousness reported after a close brush w death. (like cardiac arrest) often similar to drug induced hallucinations

-studies show 12 to 40 percent recall near eath experiences

- typical hallucinogenic experience. Replay of old memories, out of body sensation, visions of tunnels/bright lights
- patients who had temporal lobe seizures have also reported mystical experiences.
- sensation of "floating" near ceiling or seeing herself from above.
- oxygen deprivation causes hallucinations complete w tunnel vision
- oxygen deprivations turns off brains inhibitory cells, neural activity increases w visual cortex
- result=growing patch of light, looks like tunnel
- Dualist:** presumption that mind and body are two distinct entities that interact.
- mind=nonphysical, Body=physical
- 84% Americans believe in survival of soul after death

Monists: presumption that mind and body are different aspects of same thing. Do not believe in separation of mind and body

- mind does what brain does
- include scientists who think mind and body are one and theologians who think afterlife involves some form of bodily resurrection.

Chapter 8: Learning

-Learning: a relatively permanent change in an organism's behaviour due to experience.

-we learn by **association**. Mind connects events in sequence

Associated Learning: learning that certain events occur together. Events may be two stimuli (as in classical conditioning) or a response and its consequences (as in operant conditioning)

*learn something important to survival; predict immediate future.

-need **Nurture:** history of appropriate learning & **Nature:** needed genetic predispositions.

Conditioning: process of learning associations

Classical Conditioning: learn to associate two stimuli and anticipate events. Type of learning where organism comes to associate stimuli. A neutral stimulus that signals unconditioned stimulus (US begins to produce a response that anticipates and prepares for unconditional stimulus. **Pavlovian or respondent conditioning.**

-**ex.** learn that flash of lightning means crack of thunder. So we start to flinch at lightning.

Operant Conditioning: learn to associate a response (our behaviour) and its consequence and thus repeat acts followed by good results and avoid acts that give bad results.

Ex. beep on a pager means food is coming. (classical) run to food for pleasure of eating (operant)

Observational Learning: learn from others' experiences and examples. Watching others to learn things we haven't experienced.

Classical Conditioning: IVAN PAVLOV & John Watson

Watson: discard reference to inner thoughts, feelings, and motives. Study how organism responds to stimuli in environment. Based on **observable behaviour**

Behaviorism; view that psychology 1) should be an objective science that 2) studies behaviour w/out reference to mental processes. Most research psychologists agree w 1) but not w 2).

-watson and Pavlov think basic laws of learning are same for all animals.

Pavlov's Experiments: new that if he put food in dogs mouth, it would salivate. Noticed that mere sight of food causes saliva.

-put neutral stimuli alone (neutral stimulus)=no saliva(nothing)

-neutral stimuli w food(neutral + US)=saliva(UR)

-neutral stimuli alone(CS)=saliva(CR)

Unconditioned Response: (UR) in classical conditioning, the unlearned, naturally occurring response to unconditioned stimulus (US) like salivating when food is in mouth.

Unconditioned stimulus (US): stimulus that unconditionally – naturally, automatically-triggers response

Conditioned Response: (CR) learned response to previously neutral (but now conditioned) stimulus (CS)

Conditioned Stimulus: (CS) originally irrelevant stimulus but after association w an unconditioned stimulus (US) it becomes a trigger to conditioned response.

Conditioned=learned

Unconditioned=unlearned

These experiments show 5 major conditioning processes:

1)Acquisition: initial stage of classical conditioning associating neutral stimulus w unconditioned stimulus so neutral stimulus comes to start a conditioned response. (in operant conditioning, it's the strengthening of a reinforced response)

-timing: only half a second between neutral stimulus and unconditioned stimulus.

*conditioning doesn't usually happen if CS comes after US

Michael Domjan: CS signals important biological event . red light becomes a preference for lighting in sexual arousal of Japanese quail. Helps animal survive

2)Extinction: diminishing effect of a conditioned response; occurs in classical conditioning when unconditioned stimulus (US) does not follow a conditioned stimulus (CS) occurs in operant conditioning when response is no longer reinforced.

-Pavlov found if he sounds tone over and over without food, dog salivates less and less.

3)Spontaneous Recovery: reappearance after a pause of an extinguished conditioned response

-if allowed several hour break, then sound tone again, dog will remember it might mean food and salivate

4)Generalization: dog conditioned to sound of tone will respond somewhat to sound of different tone that was never paired w food..

-tendency once a response has been conditioned, for stimuli similar to conditioned stimulus to elicit similar responses.

-toddlers taught to fear moving cars also fear trucks

5)Discrimination: classical conditioning learned ability to distinguish between a conditioned stimulus and stimuli that do not signal unconditioned stimulus

-survival value

***Pavlov and Watson** underestimated importance of cognitive processes (thoughts, perceptions, expectations) and biological constraints of organisms's learning capacity.

Cognitive processes

Robert Rescorla & Allan Wagner: when 2 significant events occur close together, animal learns the predictability of the second event. If a shock always comes after a tone, and sometimes with a light and tone, a rat will fear the tone but not the light.

-the more predicatble the association, the stronger conditioned response.

-animal learns expectancy. How likely the US will occur.

Biological Predispositions: Pavlov and Watson thought learning was similar in all animals. Any natural response could be conditioned by any neutral stimulus.

-animals conditioning is constrained by its biology.

-animals learn associations that enhance survival

-even if u become sick hours after a flavor, u know not to go near it again.

Natural selection favors traits that aid survival.

-*learning lets animals adapt to their environments.

Pavlov's Legacy: classical conditioning=basic form of learning

-all organisms learn to adapt to their environment w classical conditioning.

-pavlov's experiments show scientific model of isolating building blocks of complex behaviours and studying them objectively w lab.

*classical conditioning works on body's immune system. Taste of drug can produce immune response.

John Watson's idea that human emotions and behaviour (tho biologically influenced) are mainly bundle of conditioned responses.

Watson and Rosalie Rayner: showed how fears can be conditioned. Gave baby a rat, later baby touches rat and hears loud hammer clanging. Then baby is scared of just rat.

Generalization occurs when baby is shown rabbit, dog, and sealskin coat and cries.

Operant Conditioning: type of learning where behavior is strengthened if followed by reinforcer or diminished if followed by punisher.

-organism associates their OWN ACTIONS w consequences.

-behaviors followed by reinforcers increase

-followed by punisher=decrease

Respondent behaviour: behavior that occurs as automatic response to some stimulus; Skinner's term for behavior learned thru classical conditioning.

-behavior that occurs as automatic response.

Operant Behavior: behavior that operates on environment, producing consequences. Behavior produces reward or punishing stimuli.

Skinner's Experiments: behaviorist. Most influential and controversial figure in modern behaviorism.

Thorndike had Law of Effect: thorndike's principle that behaviors followed by rewards become more likely and behaviors followed by punishments become less likely.

-skinner developed principle of behavior control. Enabled him to teach **pigeons** unpigeonlike behavior.

-skinner designed a "skinner box" or **Operant Chamber:**

chamber known as skinner box, containing bar or key thath animal can manipulate to obtain a food or water reinforcer, w attached devices to record animal's rate of bar pressing or key pecking. Used in operant conditioning research.

Shaping Behavior: skinner used **Shaping** a way to reinforce by gradually guiding animal's actions toward desired behavior.

Shaping: operant conditioning procedure in which reinforcers guide behavior toward closer and closer approximations of desired behavior.

-little by little. Step by step. Temptation

-**successive approximations:** reward little responses until u get final desired behavior. Ignore all other responses.

-gradually shape into complex behavior.

-if pigeon is reinforced for pecking after seeing human face, but not after seeing other images, pigeon learns to recognize human faces. Human face=**discriminative stimulus**.

Ex. kid whining is reinforced bc he gets something desirable. (the dad's attention)

Types of Reinforcement

Reinforcer: in operant conditioning any event that strengthens behavior it follows

Positive reinforcement: increasing behaviors presenting positive stimuli, such as food. A positive reinforcer is any stimulus that, when presented after a response, strengthens the response.

-presents pos stimulus after response. Food for hungry
-pos reinforcer=tangible reward: praise, or attention. Reward
-even being yelled at is a pos reinforcer if it causes child to keep doing the offending behavior.

Negative reinforcement: increasing behavior by stopping or reducing negative stimuli, such as shock. Neg reinforcer is stimulus that when removed after a response, strengthens the response (not punishment)

-taking aspirin to relieve headache. Push snooze button to get rid of alarm.

-escape withdrawal by getting another fix.

-removes aversive stimulus. Fastening seatbelt to turn off beeping.

Primary and conditioned reinforcers

Primary reinforcer: a reinforcer stimulus that satisfies a biological need. Getting food when hungry, being relieved from electric shock.

Conditioned Reinforcers: (Secondary Reinforcers): stimulus that gains its reinforcing power thru association w a primary reinforcer.

-learning that a light signals food is coming, so rat will work to turn on the light. Linked w basic rewards. Money is secondary reinforcer to get food, sex, women, etc.

Immediate and delayed reinforcers

-before a "wanted" behavior, animal tries a bunch of "unwanted" behavior until food reinforcer follows the behavior that is wanted. If rat presses bar and u are distracted and delay giving the reinforcer for more than **30 seconds** the rat will learn not to press the bar.

*humans can respond to reinforcers that are greatly delayed
-paycheck at end of week, good grade at end of semester

Reinforcement Schedules

Continuous Reinforcement: reinforcing desired response every time it occurs

-learning occurs RAPIDLY
-extinction occurs RAPIDLY

Partial (intermittent) reinforcement: reinforcing a response only part of the time; results in slower acquisition of response but greater resistance to extinction than continuous reinforcement.

-initial learning=slower, but extinction is less likely
-slot machines gamblers keep trying
-occasionally giving in to kids in tantrum

4 types of partial reinforcement

1) Fixed ratio schedule: operant conditioning, reinforcement schedule that reinforces a response only after a specified number of responses.

-one reward every 30 responses. First few times, animal pauses after a reinforcer, but then returns to HIGH RATE OF RESPONDING

2) Variable Ratio Schedule: reinforces a response only after an unpredictable number of responses.

-slot machine players: don't know when they will be reinforced
-HIGH RATES OF RESPONDING

3) Fixed interval schedule: reinforces response after specified time has elapsed. (every 5 min)

-people checking more frequently for mail when they know mail time is coming. Peck a key more frequently when they know its time for reward.

-choppy stop-start pattern. Not steady rate of response

4) Variable interval schedule: reinforces a response at unpredictable time intervals.

-produces slow steady responding

-checking email every day. Don't know when u get email

Punishment: event that DECREASES rate of responding . decreases behavior that follows.

-opposite of reinforcement.

-child could learn discrimination: not okay to swear around house, but okay to swear elsewhere.

-physical punishment may increase aggressiveness by demonstrating that aggression is way to cope w problems

-punishment can create fear. May associate fear to undesirable behavior AND to person who gives the punishment

-may fear a mean teacher, come to avoid school

-punishment tells you **what not to do:** reinforcement tells you **what to do.**

Cognition and Operant Conditioning

-animals behave to conditioning as they expect what repeating responses will do for them and produce reward.

Latent Learning: learning that occurs but is not apparent until there is an incentive to demonstrate it.

*latent learning appears when reinforcement begins

Cognitive Map: mental representation of the layout of one's environment. (ex. exploring a maze, rat acts as if they have a map of it)

-there is more to learning than associating a response w consequence. There is cognition.

Intrinsic Motivation: a desire to perform a behavior for its own sake. Self-expression. Challenge.

Extrinsic motivation: desire to perform behavior due to promised rewards or threats of punishment.

*people respond best to reward used not for bribe or control but to show a job well done. Most improved player award.

Biological Predispositions

-difficult to use food to reinforce and shape hamster face washing bc its not normally associated w food or hunger in natural environment. Pigeons easily learn to flap wings to avoid being shocked bc its an escape.

-pigeons have hard time learning to peck to avoid shock. Or flap wings to get food.

-biological constraints predispose organism to learn associations naturally adaptive.

Skinner's Legacy

-B.F. skinner: most controversial figure in late 20th century. Insisted that external influences (not internal thoughts and feelings) shape behavior. Urging use of operant learning to influence behavior.

-said to worry less about illusions of freedom and dignity.
Administer reward to get desirable behavior.

Applications of operant conditioning

-use teaching machines and textbooks that shape learning in small steps for immediate reinforcement of correct responses.
-computer web-based understanding=take kids at their pace.
-**at work**, reinforcing employee spirits is effective in boosting productivity. Desired performance=well defined and achievable.

-reward specific behavior. Make reinforcement immediate.

-**at home**: when parents say get ready for bed and cave in to protests or defiance, they reinforce such behaviors. Child's fearful compliance looks like reinforcement but destroys parent/child relationship.

-give children attention and other reinforcers when they behave well.

-ignore whining. Over time, if not reinforced, it will diminish

-do not yell. Time outs.

1)state ur goal

2)monitor ur progress

3)reinforce desired behavior (snack/break)

4)reduce incentives gradually. Make behavior habit.

Difference between classical and operant conditioning

-both forms of associative learning

-both involve acquisition, extinction, spontaneous recovery, generalization and discrimination.

-classical (pavlovian) conditioning, organism associates stimuli that DOES NOT CONTROL and responds automatically (respondent behaviors)

-operant conditioning, organism associates its operant behaviors-those that act on its environment to produce reward/punish stimuli w their consequences.

-cognitive processes and biological predispositions influence both classical and operant conditioning.

Learning by observation

Observational learning: learning by observing others

Modelling: observing and imitating specific behavior

Mirror Neurons: frontal lobe neurons that fire when performing certain actions or when observing another doing so. Brain's mirroring of another's action may let them imitate language learning, and empathy.

-in frontal lobe area just beside motor cortex.

-provides neural basis for observational learning.

-PET scans show humans too have mirror neurons in this brain area. Serves language.

-human mirror neurons help children learn by observation how to mime lip and tongue movements when forming new words.

-seeing a loved one's pain is not just in our faces but also our brains.

-empathy in brain involves emotional brain areas. But not the somatosensory cortex, which receives physical pain input.

-children see, children do.

Bandura's Experiments: Bobo doll

Albert Bandura: preschool kid works at drawing in one room, and adult in another part of room is working w toys. Adult gets up and for 10 minutes kicks **bobo doll** around room yelling at it.

-child is taken to another room where there are toys and bobo doll.

-kid does what parent did. Kicks and screams at bobo doll.

Observation learning

-watching TV programs, kids learn that physical intimidation is effective way to control others. That free and easy sex brings pleasure w no later misery.

-observation learning shows abusive parents might have aggressive children.

Prosocial behavior: positive, constructive, helpful behavior.

Opposite of antisocial behavior.

-people who show nonviolent, helpful behavior to promote similar behavior in others.

-exposed to a hypocrite, imitate hypocrisy.

Television and observation learning

-avg kid sees 8000TV murders and 100 000 other acts of violence before finishing elementary school.

-correlational studies link violence TV viewing to violent behavior.

-more hours elementary school kids spend in media violence, more they get in fights

-more hours watching violence, more at risk for aggression and crime as teens and adults.

-homicide rates **doubled** between 1957 and 1974 bc of introduction of TV in US and Canada

-**higher levels of viewing violence on TV =correlated w increased acceptance of aggressive attitudes.**

-correlation DOES NOT imply causation.

-studies do NOT PROVE viewing violence causes aggression

-encourages aggression especially when on TV it goes unharmed

-**imitation**

-prolonged exposure causes **desensitized viewers** to the immorality of violence.

-while spending three evenings watching sexually violent movies, male viewers became less bothered by rapes and slashings.

-less sympathy for real violence victims. Rated victims injuries less severed.

-watching cruelty fosters indifference.

Chapter 12: Motivation & Work

Motivation: a need or desire that energizes behavior and directs it toward a goal.

Charles Darwin= evolutionary theory /**instinct theory**
-**does not explain human behavior. Just names them.**

Instinct: complex behavior that is rigidly patterned thru/out a species and is unlearned. Naturally have it.

-infant's rooting and sucking thumb

-most psycs think human behavior is directed by **physiological needs and psychological wants.**

-more complex nervous system=more adaptable organism

Drive-reduction theory: idea that physiological need creates an aroused tension state (a drive) that motivates an organism to satisfy this need.

-organism reduces need by eating or drinking.

-when physiological need increases, so does drive/aroused motivated state.

Homeostasis: tendency to maintain a balanced or constant internal state; the regulation of any aspect of body chemistry, such as blood glucose, around a particular level.

-aim of drive reduction. "maintenance of a steady internal state"

-homeostasis=body temp regulation system

-if water level in cell drops, we feel thirsty.

Incentives: a pos or neg environmental stimulus that motivates behavior.

-we are pushed by our "need" to reduce drives, and "pulled" by incentives.

Drive reduction theory: need, drive, drive reducing behavior.

-food, hunger, eat

food-deprived person who smells baked food, has stronger hunger drive.

Optimum Arousal

-some motivated behavior actually **increases arousal.**

-human motivation aims not to eliminate arousal, but to seek optimum levels of arousal. Having all biological needs satisfied, we feel driven to experience stimulation.

-w/out stimulation, we feel bored. Look for way to increase arousal to **optimum level.**

Hierarchy of Needs: Abraham Maslow's idea. Maslow's pyramid of human needs, beginning at base w physiological needs that must first be satisfied before higher level safety needs and then psychological needs become active.

-once our lower-level needs are met, we can satisfy our higher level needs.

-hunger and then social.

Hunger

-Ancel Keys: 36 male volunteers for hunger experiment. Six months they cut the food level in half. Body weights dropped rapidly but **stabilized** at about **25% below starting weights:**

-psychological effects were dramatic.

-men became obsessed w food.

-lost interest in sex and social activities.

-preoccupied w unfulfilled basic need

Physiology of Hunger

-A.L. Washburn & Walter Cannon

-washburn swallowed balloon. Inflated his stomach

-while stomach was monitored, pressed key ea time he felt hungry

-had stomach contractions whenever he felt hungry BUT

-some hunger existed even w a full stomach

Body chemistry and Brain

-body somehow keeps tabs on available resources.

Glucose: form of sugar that circulates in blood and provides major source of E for body tissues. When its level is low, we feel hungry.

-if hormone **insulin** (secreted by pancreas) cause blood glucose to decrease by converting it to stored fat.

-body maintains certain glucose level. If that level **drops, u get hungry**

-signals of hunger come from **stomach, intestines, and liver**

-all signal brain to eat or not.

Hypothalamus and Hunger

-hypothalamus controls hunger.

-2 distinct hypothalamic centers

1) Lateral Hypothalamus: brings on hunger.

-if stimulated=overeating. Release of **orexin hormone**

-destroyed= no eating. anorexia

2) Ventromedial Hypothalamus: depresses hunger

-stimulate=undereating. Stop eating

-destroy it=overeating obesity.

*people w tumors near base of brain (lower mid hypothalamus) overeat like crazy.

Hypothalamus monitors levels of body appetite hormones

-Ghrelin: hunger arousing hormone secreted by empty stomach

-after bypass surgery, less ghrelin=no appetite

Set Point: point where person's "weight thermostat" is supposedly set. When body falls below this weight, an increase in hunger and lowered metabolic rate may act to restore the lost weight.

Basal Metabolic rate: body's resting rate of E expenditure.

How fast body uses energy to maintain basic body functions.

***Settling point:** point where person's weight settles in response to caloric intake and expenditure.

Psychology of Hunger

-carbohydrates: help boost levels of NT **serotonin** which has calming effects.

-preference for sweet/salty tastes are genetic and universal.

-culture affects taste: eye of camel=nice to some people, north Americans find repulsive.

-w repeated exposure, appreciation for new taste=increases and willingness to try another.

-Neophobia: avoid unfamiliar foods. Protection from potentially toxic substances.

Eating Disorders

Anorexia nervosa: eating disorder where normal-weight person (usually adolescent female) diets and becomes significantly (15% or more) underweight. Yet, still feels fat and continues to starve.

-9 out of 10 times female

-low self-evaluation.

-come from competitive, high achieving protective families

bulimia nervosa: eating disorder where people have episodes of overeating, usually high-calorie foods, followed by vomiting, laxative use, fasting, or excessive exercise.

-late teens or early twenties

-mostly women

-preoccupied w food (crave sweet/high fat) but scared of overweight.

-experience depression and anxiety

-serious binges

-UNLIKE anorexia, bulimia is marked by **weight fluctuations** makes condition easy to hide.

*eating disorders Do NOT show childhood sexual abuse

-mothers of girls w eating disorders are usually focused on their own weight and on daughter's weight and appearance.

-families of bulimia patients usually have higher than usual incidence of obesity and negative self evaluation.

-genetics can influence eating disorders.

- if twins are identical rather than fraternal, chances of other twin having same disorder=greater.
- body ideals change w culture.
- india=women rate ideals as close to their actual shape
- africa=underweight means not rich, poverty, AIDS (bigger is better)
- western cultures=rise in eating disorders over last 50 years. Increase in women having poor body image.
- vulnerable=ideal thinness poor body satisfaction. Most often women.
- cultural pressure=thin ideal in fashion magazines, advertisements, even toys like Barbie.
- women feel ashamed, depressed, dissatisfied w bodies.

Barbie doll: defines body shape of approximately fewer than 1 in 100 000 women.

- weight obsessed cultures: "fat is bad" motivate women to "always diet"
- encourages eating binges by pressuring women into living constant state of semistarvation.
- eating behavior is affected by **psychological and social=cultural influences.**

Sexual Motivation: most men and nearly half of women report having premarital ksex.

- most women and virtually all men=masturbated
- women who reported masturbating to orgasm before marriage, seldom had difficulties experiencing orgasm after marriage.

Physiology of sex

Sexual response Cycle: four stages of sexual responding described by **Masters and Johnson**- excitement, plateau, orgasm, resolution.

1) **Excitement phase:** genital areas become engorged w blood, woman's vagina expands and secretes lubricant, breasts/nipples enlarge

2) **plateau phase:** excitement peaks, breathing pulse, blood pressures continue to increase.

-penis fully engorged and some fluid (containing live sperm to enable conception) appears at tip

-vaginal secretion continues to increase. Clitoris retracts. Orgasm feels imminent.

3) **Orgasm:** muscle contractions all over body during orgasm.

Further increase in breathing, pulse, blood pressure rates

-woman propels semen in from penis, positioning uterus to receive sperm. Draws sperm further in.

-woman's orgasm reinforces intercourse, increases retention of deposited sperm.

-PET scan shows same subcortical brain regions glow when men and women have orgasm

-fMRI shows brain responds to stranger or beloved the same

4) **Resolution phase:** man enters **Refractory Period**, lasts a few minutes to a day or more where he cant have another orgasm. Female's refractory period=shorter.

Refractory period: resting period after orgasm, where man cannot have another orgasm.

Sexual disorders: problem impairing ability to have sex arousal or functioning.

- lack of sexual energy, or arousability.
- premature ejaculation or erectile disorder. (cant have erection)
- for women (orgasmic disorder: cant have orgasm)

-most women who have sexual distress relate it to their emotional relationship w the partner during sex. Not to physical aspects of the activity.

Hormonal and sexual behavior

-in animals: sex is for fertility

-female is most receptive (in heat) when production of female hormone **estrogen** peaks at ovulation

Estrogen: sex hormone secreted in greater amounts by females than males. In nonhuman female mammals, estrogen levels peak during ovulation promoting sexual receptivity.

-female can be stimulated to receptivity by injecting estrogen.

-male hormone levels are constant.

-losing testes cause men to have less interest in sex.

Testosterone: most important male sex hormone. Both males and females have it but addition testosterone in males stimulates growth of male sex organs in fetus and development of male sex characteristics during puberty.

***in humans, hormones influence sexual behavior but sexual desire rises more at ovulation among women.**

-women's sexuality is more responsive to testosterone level than to estrogen level.

Women

-if women's natural testosterone level drops as happens w removal of ovaries or adrenal glands, her sexual interest decreases.

-testosterone-replacement therapy increases sex drive

Men

-normal fluctuations in testosterone levels have little effect on sex drive.

-fluctuations in male hormones are partly a response to sexual stimulation.

-men's testosterone levels rise w social arousal, but **especially** after talking to female.

-sexual arousal can be a cause as well as consequence of increased testosterone levels.

*interest in dating and sexual stimulation increases w pubertal surge in sex hormones. As happens w male testosterone levels during puberty.

-depo-provera lowers sex urge. Reduces testosterone level.

Psychology of sex

-hunger responds to NEED

-sex is NOT a biological need.

-both depend on internal physiological factors. Both influenced by external and imagined stimuli as well as cultural expectation

External stimuli

-men=more aroused when they see, hear, or read, erotic material

-most women have just as much arousal this way.

-w repeated exposure, emotional response to any erotic stimulus often **habituates (lessens)**

-if women are seen on TV enjoying being sexually coerced, it increases viewer's acceptance of false idea that women enjoy rape and tend to increase male viewer's willingness to hurt women.

-images of sexually attractive women and men also lead people to devalue their own partners and relationships.

-after male collegians watch TV or magazines of sexy girls, they find average woman or gf/wives less attractive.

-watching erotica can create expectations that can't be fulfilled.

Imagined Stimuli

-BRAIN=**most significant sex organ**

-stimuli inside our heads/imagination/influences sex arousal and desire

-erotic potential of dreams

-genital arousal occurs in dreams even in dreams w no sex content.

-**nearly all men (40% of women) have dreams that have sex imagery that leads to orgasm.**

-**95% men and women** say they have sex fantasies.

-**men fantasize about sex (gay or straight) more often. More physically, less romantically.**

-men prefer less personal, and faster paced sex content in books and videos.

Adolescent Sexuality

-**increased risk of STD**

Teen Pregnancy

-American teens have lower rates of intercourse than European teens. But higher rates of teen pregnancy and abortion (less use of birth control)

Ignorance: half of sexually active teens have mistaken ideas about which birth control methods protect them from pregnancy and STIs

Guilt related to sexual activity: keeps them from using birth control if passion overwhelms intentions. Not wanting to "appear promiscuous" they don't use condoms.

Minimal communication about birth control: not

comfortable discussing birth control w parents/partners/peers

Alcohol use: less likely to use condom. Alcohol breaks down normal restraints, also sexually coercive males.

Sexually Transmitted Infections

-**2/3ds of new infections occur in people under 25**

-teen girls, bc less mature biological development and lower levels of protective antibodies, vulnerable to STIs

ex. if pat has sex w 9 people, and they ea have sex w 9 other people, u have 511 "phantom sex partners"

-condoms offer NO protection against skin to skin STI like human papilloma virus (responsible for genital cancers)

-condoms do reduce tenfold risk of contracting HIV from infected partner.

Predictions against Sex Restraint

High Intelligence: smart teens delay sex

Religiosity: religious teens and adults reserve sex for marital commitment

Father Presence: father's absence linked to sex activity before age 16

Participation in service learning programs: teens who volunteer as tutors or teachers or community projects have lower pregnancy rates

Sexual orientation: enduring sex attraction toward members of either one's own sex (homo orientation) or other sex (hetero orientation)

-cultures vary in attitude toward homosexuality.

-all cultures are **DOMINANTLY** heterosexual

-heterosexuality prevails, but homosexuality survives.

-**most homo people** report not becoming aware of same sex attraction until during shortly after puberty, and not thinking of themselves as gay or lesbian until around age 20.

Sexual Orientation Statistics: homosexuals were assumed to be 10%. But results show that

Homo men: 3-4%

Homo women: 1-2%

-**2.5% of population is gay or lesbian**

-**women's orientation is more easily changed than men's.**

-**women more often** prefer to alternate periods of high sexual activity w periods of almost none. More likely to be bisexual.

-gays and lesbians have more depression and risk of suicide attempts. (comes from bullying and harassment/discrimination)

Origins of Sex Orientation

-**HOMO is NOT LINKED WITH**

1) childhood problems

2) fear or hatred of other gender

3) sex hormones currently in blood

4) childhood molestation/seduced/victimized sexually

*homos ARE no more likely than heteros to have had these experiences.

-homos appear more often in certain pops.

Ray Blanchard: men who have older brothers that are gay are more likely to be gay.

Fraternal birth order effect: sons born later down line of kids are more likely to be gay.

-reason=unclear. Mbe bc maternal immune response to foreign substances produced by male fetuses. Maternal antibodies got stronger after ea pregnancy w male fetus and prevent fetus brain from developing normally.

-one theory=people develop same-sex erotic attachments if segregated by gender at time of sex drive maturation. Gay men have earlier puberty. When peers were likely all male. -homo behavior does NOT always indicate homo orientation

Same Sex Attraction in animals

-**Wendell and Cass**=penguins that love ea other. Same sex.

-some degree of homosexuality is natural in animal world

Brain and sex orientation:

Simon LeVay: studied sections of HYPOTHALAMUS

-found that cell cluster was LARGER in heterosexual men and women than most homo men.

Everything psychological is simultaneously biological

-**LeVay:** neural center is sexual orientation center. Important part of neural pathway engaged in sex behavior.

-believes its more likely that brain anatomy influences sex orientation.

-straight women smell men's sweat, their hypothalamus lights up in area governing sex arousal. Gay men's brains respond similarly to men's scent. Straight men brains show arousal to ONLY female hormone derivative.

-gays and lesbians differ from straight counterparts in preference of sex related sweat odors.

Laura Allen and Roger Gorski: section of anterior commissure (fibers like corpus callosum that connect right and left hem) is **one third larger** in homo men than hetero men.

Genes and sex orientation

-**homo does appear to run in families**

-**twins show genes have substantial role in individual dif in sex orientation.**

-single gene in fruit fly that if put in another fruit fly will cause it to be homo.

Prenatal hormones and sex orientation

-there are elevated rates of homo orientation in identical AND fraternal twins, suggests not just shared genetics but also shared prenatal environment may be factor.

-abnormal prenatal hormone conditions alter fetus' sexual orientation

Gunter Dorner: shows pregnant sheep are injected w testosterone during critical period of fetal development and female offspring later show homo behavior.

-gay men have fingerprint patterns similar to heterosexual women.

-lesbians have male typical traits.

-cochlea and hearing system develop in way that is intermediate for those heterosexual females and heterosexual males.

-attributable to prenatal hormones

-homo men's **special abilities** are same as heterosexual women.

-genes code for prenatal hormones and brain anatomy which show **temperaments** that lead children to prefer gender-typical or gender-atypical activities and friends.

-preference may later lead children to feel attracted to whichever sex feels dif from their own.

-dissimilar seeming sex becomes associated w anxiety and other forms of arousal. Transformed into romantic arousal.

-nature more than nurture

-orientation difficult to change.

Sex and human value

-sex ed apart from context of human values may suggest sex is recreational.

-u could know everything about sex, but fail to understand human significance of sex intimacy

-yearning for closeness in sex motivation. Sex at human best is life-uniting and love-renewing.

-sex fulfills **biological motive & social need for intimacy**

Need to Belong

-**Aristotle:** Social animal.

Iding survival: social bonds boost ancestor survival rates.

-need to belong survive and reproduce most successfully.

Genes now predominant. We are innately social creators.

-self esteem increase when we feel included

Maintaining relationships: children in foster homes that move around frequently w repeated disruption of budding attachments have difficulty forming deep attachments.

Pain of ostracism: need to belong is denied. Excluded, ignored, shunned. Receive silent treatment.

Kipling Williams: studied ostracism; social exclusion in natural and lab settings. Humans use ostracism as control social behavior mechanism w punishing effects.

-**Kipling Williams and Lisa Zadro:** ostracism increases activity of brain area **anterior cingulate cortex** that also is activated during physical pain.

-experience ostracism=experience real pain.

Fortifying Health: people w friends=happier.

-people who feel supported live w better health & lower risk for psychological disorder or premature death.

-married people=less risk for depression, suicide, early death.

Motivation At Work

Flow: completely involved, focused state of consciousness, w diminished awareness of self & time, resulting from optimal engagement of one's skills.

-work as if nothing else matters. Forget about it once they are finished.

-flow experiences boost of self esteem, competence and well being.

-Idleness is boring to us.

Psychological contract: subjective sense of mutual obligations between workers and employers.

Industrial-organizational (I/O) psychology: application of psyc concepts and methods to optimizing human behavior in workplaces.

Human facts psychology: how machines and environments can be optimally designed to fit human abilities.

Personell psychology: subfield of (I/O) psyc that focuses on employee recruitment, selection, placement, training, appraisal, and development.

Organizational Psychology: subfield of I/O psyc that examines organizational influences on worker satisfaction and productivity. And facilitates organizational change. Manage worker motivation, satisfaction, productivity.

-organization psychologists modify jobs and supervision in ways to boost morale and productivity.

Personnel Psychology:

-selecting and assessing employees.

-identify needed job skills

-train new employees. Analyze performance

Harnessing Strengths

Mary Tenopyr: 1) asks new applicants to respond to various questions

2) assess which applicants excel in job

3) identify individual items on earlier test that predict who succeeds.

*aim is to match people's strengths w work that enables them and their organization to flourish.

-ur strengths are enduring qualities that can be productively applied.

Marcus Buckingham & Donald Cliften: first step to stronger organization is instituting strengths-based selection system.

-if u need to hire new people in software development, hire people w experience in the strengths that encourage success.

"systematic logical approach to problems, strive for timely completion etc)

-identify people's strengths and match strength to work

interviews predict performance? Interviewer judgment=weak predictor.

Frank Schmidt & John Hunter found subjective evaluations do not work. Informal interviews are less informative.

Interviewer Illusion: I have excellent interviewing skills, and don't need reference checking as much as someone who doesn't have my ability to read people.

4 factors show gap in interviewers intuition:

1) interviews disclose applicant good intentions. "applicants say what they "will" do.

- 2) interviewers follow successful careers of those they have hired in the past and wont hire people similar to those they rejected and lost track of.
- 3) interviewers assume people are what they seem to be in interview situation
- 4) interviewer's preconceptions and mood color how they perceive applicant responses.

Structured interview: interview process that asks same job-relevant questions of all applicants, ea of whom is rated on established scales.

-ex. unstructured=how organized are u
 -structured "tell me about a time when u were caught between conflicting demands w/out time to accomplish both. How did u handle it."

-structured interview=double predictive accuracy than unstructured.

-personnel psychologists assist organizations in analyzing jobs, recruiting well-suted applicants, select and place employees, appraise performance.

Appraising Performance:

- checklists: check behavior or worker
- graphic rating scales: check worker is dependable, productive
- behavior rating scales: check behavior that describes worker performance. Extent to which they "follow procedures"

-performance feedback comes from supervisors AND all organizational levels.

360 degree feedback: rate yourself, manager, colleagues, and be rated back by manager, colleagues, and customers.

*performance appraisal=vulnerable to bias

-halo errors: occur when one's overall evaluation of an employee biases rate of specific work related behavior such as reliability. (person rates "good at work" if they like personality)

-Leniency: and **severity error:** reflect evaluators tendency to be too easy or too harsh on everyone

Recency errors: when rater focuses on one thing they remember that happened recently in behavior.

Organizational Psychology: Motivating Achievement

Achievement motivation: desire for significant accomplishment; for mastery of things, people, or ideas; attaining high standard.

-high achievement motivation=achieve more.

-grit: passionate dedication to an ambitious long term goal

-organizational psychologists seek way to engage and motivate ordinary people doing ordinary jobs

Satisfaction and Engagement: satisfaction w work=satisfaction in life.

-decreased job stress=improved health.

Employee engagement: extent of worker's involvement, satisfaction, and enthusiasm.

James Harter and Frank Schmidt and Theodor Hayes: discovered correlation between organizational success and employee engagement. Found engaged workers know what's expected.

-they know what they need to do in work, feel fulfilled.

Managing Well

Harnessing job-relevant strengths

-managers who exel spend less time trying to instill talents that are not there and more time developing and drawing out what is there.

Great managers:

- start helping people identify talents
- match task to talent
- care about how people fell
- reinforce pos behavior

rather than focus on weakness, focus on training time and educating people about their strengths and build.

***basic principle of operant conditioning: teach behavior=catch a person doing something right=reinforce it.**

-people do best if they have progress reports

-reach boosts of self-evaluation.

-Implementation intentions: action plans that specify when, where and how they will march toward achieving goals.

Become focused on work and comletion.

Choosing appropriate leadership style

Task Leadership: goal oriented leadership that sets standards, organizes work, and focuses attention on goals.

-good at keeping group centered on mission

-directive style

Social leadership: group oriented leadership, builds teamwork, mediates conflict and offers support.

-mediate conflicts. Build high-achieving teams.

-domocratic style: include everyone

-good for morale

Great person theory of leadership: all great leaders share certain traits. Personality does matter. Charisma. Ned vision of goal and ability to communicate.

Transformational leadership: motivates others to identify w and commit themselves to group's mission. Natural extraverts.

Voice effects: if given chance to voice opinion during decision making process, people respond more positively to decision

Command and control: management process to a **joint**

vision process: push decision=making planning and strategizing from handful to everyone.

***what unifies all motives is thei common effect: energizing and directing behavior.**