History

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300 BCE- Aristotle, Greek naturalist and philosopher

First Laboratory:
- 1879, University of Leipzig in Germany -> William Wundt
- Wundt- trying to measure simplest mental processes

Structuralism and Functionalism: 2 early schools of psych
- Structuralism: Edward Titchener -> minds structure
    - Engaged in introspection
        - Unreliable
    - Eventually dies out
- Functionalism: William James
    - Consider function of thought and feeling
    - Influenced by Charles Darwin
    - Thinking developed bc it was adaptive
    - Principles of psychology

Women in PSY
- James admitted Mary Calkins into his seminars @ Harvard
- All the male students then dropped out
- She was tutored privately
- She outscored all the men, was only offered a college degree
- Eventually became first female president of APA

PSY Science develops

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Behaviorism:

- Initially psychology was defined as the science of mental life (Wundt, Titchener, James)
- 1920s- Watson and Skinner. American psychologists -> science of observable behaviour
- Behaviorist became one of 2 major forces until 1960s

Freudian PSY:

- Second major force
- Unconscious thought processes and emotional response comes from childhood experiences

Humanistic PSY:

- 1960s: 2 new groups reject behaviorist definition of PSY
- The first -humanism led by Rogers and Maslow
- Focus on current factors influence growth potential & importance of need/love

Cognitive Revolution:

- Second group
- Leads field back to mental processes - processing/retrieving info
- Treatment for depression
- Cognitive neuroscience: combo of cognitive psy and neuroscience
    - Studies brain activity that causes mental activity

Modern Definition:

- Defined as science of behaviour and mental processes

Contemporary PSY

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- Initially developed from philosophy and biology

Evol. PSY and Genetics
- Nature-nurture issue
- Plato- Greek, some ideas are innate
- Aristotle- acquired ideas
- 1600 philosophers revive debate:
    - Locke- acquired
    - Descartes- innate
- Evolutionary psy: study of evol of behaviour and mind, using principles of natural selection
    - Focus: how are humans alike bc of common bio and evol history
- Behaviour genetics: study of relative power and limits of genetic/environ influence on behaviour
    - Why are we diverse bc of differing genes and environ

Cross-cultural and Gender PSY
- Mental issues/brain activity is the same all over the world
- Men - have conversations to give info and advice
- Women-have convos to build relationships
- Men ad women- learn to talk, walk, experience sensations @ same time
- Attitudes/behaviours may vary but underlying causes are the same

Positive PSY:
- Studying human function with the goal of improving life

PSY 3 main levels of analysis:
- Tiers of analysis = complementary outlook
- Diff level form : biopsychosocial approach

Current perspectives:
- Neuroscience: body & brain enable emotions, memories and sensory experiences
- Evolutionary: natural selection of traits has promoted survival of genes
- Behaviour genetics: genes and environ influence individual diff
- Psychodynamic: behaviour springs from unconscious
- Cognitive: encoding, processing, storing and retrieving info
- Social-cultural: behaviour and thinking vary across situations and cultures

PSY subfields:
- Basic research: builds psychology's knowledge base
- Applied research: scientific study that aims to solve practical problems
- Counseling PSY: assists people with problems in living and achieving well being
- Clinical PSY: studies, assesses and treats PSY disorders
- Psychiatrists: medical doctors licensed to prescribe drugs and treats Phys causes of disorders
- Community PSY: create social and Phys environ that are healthy

The Need for PSY Science

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Human intuition is not reliable as science because of :

- Hindsight bias
- Overconfidence
- Tendency to perceive patterns in random events

Intuition: effortless, immediate, automatic feeling/thoughts as contrast w/ explicit, conscious reasoning

Hindsight bias: tendency to believe, after learning the outcome, that it could've been foreseen

- Asking people to explain why they acted/ how they felt is misleading as they are being swayed by the outcome

Overconfidence: thinking we know more than we do (ability to predict)

Perceiving order in randomness: natural eagerness to make sense of world -> perceiving patterns
Random sequences may not appear/look random

Research Strategies

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Scientific Method:

- theory: explains behaviors/events by offering ideas that organize observations
- Good theory = testable predictions -> hypothesis
- Operational definitions: check/minimize bias -> carefully worded statement of exact procedures used in study -> used in replication
- Replication: repeating essence of research study w/ diff participants to test findings reliability

Theory is only useful if :

- Organizes observations
- Implies predictions that can be tested
- Stimulates further research

Hypothesis can be tested using :

- Descriptive methods: describe behaviours through case studies/ surveys
- Correlational methods: associate diff factors
- Experimental methods ; manipulate factors to discover effects

Descriptive methods : survey, case study, naturalistic
Individual case studies suggest ideas for universal truths -> but further research is needed to prove

Description: case studies, naturalistic observation, surveys

- The Case Study:
  - One of the oldest research methods
  - Attempts to study group/person to reveal a universal truth
  - Individual cases can be misleading, as they are easier remembered then stats
- Naturalistic Observation:
  - Small science
  - New tech- big data observations
  - Observing behaviour in naturally occurring situations w/ no manipulation
  - Doesn't explain why things happen bc you cant control factors
- Survey:
  - Many cases, less depth
  - Self reported attitudes/ behaviours -> uses representative, random sample, answer can depend on wording and audience
  - Wording effect: phrasing of words/ connotation
  - Random sampling -> computer generated randomness, eliminates sampling bias (the outlier cases may stand out the most), if survey was self return -> only those with strong opinions would return it = bias
  - Representative sample= everyone ins population as an equal chance of being sampled
  - Population: all those in a group being studied from which samples can be drawn (100 students (sample) are chosen from the university of Ottawa (population))

Correlation:

- predict, not cause as there can be 3rd/4th factors influencing the explanation -> can indicate the possibility of cause/effect
- Correlation efficient: statistical measure that helps us figure out how closely two things vary together/ how well they predict each other -> value can equal -1, 0, +1
- Scatter plots are used :
  Positive linear = +1
  Random distribution = 0
  Negative linear = -1

Regression towards the mean:

- illusory correlation : believing there is a relationship between 2 things -> causes you to recall instances that confirm (ignoring disconfirming examples) -> supported by statistically phenomenon where there is a tendency for extreme/unusual scores/events to fall back towards the average

Correlation & Causation

- Correlation only helps predict, indicates possibility of cause-effect relationship

Experimentation

- Isolates cause & effect by manipulating dep. & indep. Variables while controlling other factors
- Two groups: control & experimental
  - Experimental - receives treatment
  - Control = serves as comparison to exp. Group to se if treatment is really working\
- Random assignment used to make groups -> assigning by chance minimizes pre existing difference between groups that may sway survey

- Can have a placebo group & treatment group : double blind procedure -> both patients and administers don't know who is assigned to which group

- Placebo effect: experimental results caused by expectations alone -> change in behaviour due to belief o treatment

- Results cant be generalized to other contexts, not always possible, sometimes unethical

Predicting real behaviour : experiments don't necessarily replicate everyday behaviour/ seek to explain every day actions

- They aim to test theoretical principles that will explain everyday behaviour *general principles*

PSY Research Ethics

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Protecting Research Participants:

- Protecting animals in research
    - Share many biological traits with humans
    - Animal protection mvm protests use of animals as they are similar to us and should be respected
    - 2 issues: are animals more important than humans? + How should we safeguard animals?
- Protecting humans:
    - Ethic codes of APA urges:
        - Obtain potential participants informed consent
        - Protect from harm/discomfort
        - Keep info confidential
        - Debrief people afterwards

Statistical Reasoning

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- Humans can be misled by media/mouth-mouth spreading of big estimates
- Humans are more likely to trust specific numbers

Describing data: descriptive stats representing data

- Measure of central tendency: single score represents whole set, mode/median/mean, can be some distortion if numbers are skewed
- Measure of Variation: how similar/diverse scores are -> lower variability = more reliable
    - Standard deviation: computer measure of how much scores vary from mean
    - Range: difference between max and min
    - Normal Curve: symmetrical, bell curve that describes data distribution, most scores fall near mean (68%) and fewer near extremes

Significant differences : differences in findings/ data happen; when are the significant?

Observed difference reliability:

- Rep. samples > reliable than biased sample
- Less variable observations = more reliable
- More cases > fewer

Observed difference significant:

- If the averages from 2 samples are reliable (each has many observations w/ low variability and uses a rep. sample) -> diff is reliable
- If samples are reliable + difference is large = difference reflect a real diff in population -> statistical significance

Neural and Hormonal Systems

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- Plato- brain in spherical head
- Aristotle- mind in the heart

Phrenology:
- Early 1800- German physician Franz Gall
- Studying bumps on skull = person's mental abilities/traits
- Interest faded, focused attention on localization of function -> each brain region has a function

Biological Perspective:
- Link between bio and behaviour
- Discoveries:
    - Nerve cells conduct electricity and talk to one another by sending chem messengers across synaptic cleft
    - Specific brain system = specific function
    - Process info form each system to create sound, sight, memories, meaning, pain, passion
    - Adaptive brain -> wired by experience
    - Body is composed of subsystems

Neural Commun.
- Building blocks of neural system = neuron
    - Cell body + dendrite
- Myelin sheath: insulates axon, speeds impulses, continues to be layed till 25
- Multiple sclerosis -> degenerates myelin sheath, slow muscle communication, eventual muscle control loss
- Glial cells - support nerve cells, provide nutrients and insulating myelin, guide neural connections, mop up ions and neurotransmitters
    - Transmit info and memories
- Complex animal brain = greater proportion of glia to neurons

Neural Impulse:
- Triggered by senses or neighboring neurons
- Action potential : brief electrical charge that travels down its axon
- Speed = depends on type of fiber -> 2m/hour-200m/h
- Resting membrane potential : positive outside-negative inside state
- Temporary inflow of positive ions = neural impulse/AP
- Increasing level of stim above threshold will not increase the neural impulses intensity

How Neuron's Communic
- Sir Charles Sherrington - discovered synapse
- Synaptic cleft/gap point of communication
- Santiago Ramon y cajal - protoplasmic kisses
- Chemical messenger -> NT
- Travel syn. Cleft w/in 1/10 000th of a second
- Reuptake- process of removing excess NT

NT Influence
- ACh - one of the best understood, role in learning and memory, muscle action : Alzheimer's
- Dopamine: mvm, learning, attention, emotion : too much = schizo. Not enough = parkinsons
- Serotonin: mood, hunger, sleep arousal: depression
- NE: alertness, arousal: depressed mood

- GABA: inhibitory: lack = seizures, tremors, insomnia
- Glutamate: excitatory, memory: oversupply= migraines/seizures
- Endorphins= natural opiates, where morphine binds

Drugs and NT
- When receiving extra opiates, brain will stop producing its own -> leads o withdrawal
- Agonist mcls: increase NT function
    - Production, release, block reuptake
    - Bind to its receptor ad mimic effect
- Antagonist: decrease NT function
    - Blocks production/release -> similar enough to block site but not to mimic effects

Nervous System:
- CNS : brain + spinal cord - decision maker
- PNS: gathering info and transmitting CNS decisions to other body parts
- Nerve: formed of bundle of axons
- 3 types of neurons
    - Sensory- signals from tissue to CNS
    - Motor- instructions from CNS to tissues
    - Interneurons

Peripheral Nervous System:
- Somatic and autonomic
- Somatic= voluntary skeletal muscle
- ANS: glands and internal; organ muscles
    - Sympathetic
    - Parasymp

Central Nervous System:
- Brain = 40 bill neurons
- Brain neurons clusters= neural network
- Spinal cord: two way information highway , connects PNS and brain
- Neural pathways govern reflexes -> simple. Automatic response to stimuli
- Simple spinal reflex pathway: 3 neurons

Endocrine System
- Interconnected w/ nervous system
- Some hormones are identical chemically to NTs
- Nervous system - info travels in a fraction of a second
- Endocrine messages take longer to travel through blood-> sec/mins
- Endo messages outlast neuro
- Most influential endo gland = pituitary

Discovery & Old Brain Structures

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Tools of discovery:
- Modern day: scientists can "lesion" (destroy) tiny clusters of brain ells -> show the impacts
- Can also stimulate electrically, chem, magnetically
- Electroencephalogram EEG: amplified read out of the waves caused by electrical activity in brains by neurons
    - Filters out info unrelated to stimulus
- Positron emission tomography (PET): : shows brain activity by tracking consumption of radioactive glucose
    - Brain = 2% of body weight, consumes 20% of calorie intake
- Magnetic resonance imaging MRI: head is placed in mag field, aligning spinning atoms, when disorientated and returning to proper place emit signals -> creates detailed image of soft tissue

Older brain structures:
Non complex: basic human function (shark)
Complex: emotion and memory (rodents)
Advanced mammals: foresight (humans)

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1. Brainstem
- Oldest and innermost region
- Begin where spinal cord swells after entering the skull (medulla)
- Basic breathing functions- lungs and heart
- Can be vegetative state and still function
- Above medulla: pons -> control mvm and sleep
- Can still run, jump, sleep and breath but w/out purpose
- Crossover point to communicate between both sides of brain

2. Thalamus:
- Brains sensory control center
- Receives info from all senses except smell -> sends to higher brain center
- Receives some higher brain responses -> medulla -> cerebellum

3. Reticular Formation:
- Inside brainstem, between ears
- Neuron network extending from the spinal cord though thalamus
- As sensory info flows to thalamus, some stops at reticular formation
    - Filters incoming stimuli, relays important info and controls arousal

4. Cerebellum:
- Rear of brainstem, baseball sized
- Nonverbal learning and skill memory, emotions, sound/texture
- Coordinates w/ pons voluntary mvm

The Limbic System:

Newest/higher regions of brain: cerebral hemispheres
Between new and old : limbic system
- Contains: amygdala, hypothalamus, hippocampus
- Hippocampus: conscious, explicit memories

Amygdala:
- 2 lima bean sized neural clusters -> aggression and fear

Hypothalamus:
- Governs bodily maintenance

Hypothalamus:

- Governs bodily maintenance

Cerebral Cortex/ Divided Brain

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- newer neural networks withino cerebrum -> perceiving, thinking, speaking
- Cerebral cortex covers the two sides of cerebrum -> interconnected neural cells, control and processing center
- Moving up ladder of animal life = cerebral cortex expands, genetic controls relax, adaptability increases
- Cortex = makes us human

Structure of cortex:
- Flat cerebral cortex= 3x space
- Left and right hemisphere = mainly axons connecting cortex and brain regions
- 4 lobes/ hemisphere, separated by fissures
    - Fontal, parietal, occipital, temporal

Functions of Cortex:
- Motor cortex - rear of frontal lobe, moves opp side of body
    - More cortical space for more fine mvm/precision
- Sensory functions:
    - Somatosensory cortex- front of parietal lobes
        - Specializes in receiving info from skin and mvm
        - More cortical space for more sensitive areas
    - Visual cortex: back of occipital lobe

Association Areas
- Motor/sensory cortexes occupy 1/4th of cerebral cortex
- Association areas = higher mental functions
- Electrical probing doesn't produce visible response
- Prefrontal cortex: judgement, planning, processing new memories, moral compass
- Association areas near parietal lobe: mathematical and spatial reasoning
- Association area on underside of right temporal lobe: recognizing faces
- Mental experiences arise from coordinated brain activity

Brain Plasticity
- Brains sculpted by genes and experiences
- Plasticity - anility to modify itself after damage
- Some brain damage effects can be traced to 2 facts:
    - Severed brain and spinal cord neurons do not regenerate
    - Some brain functions seem preassigned to specific areas
- Some neural tissue can reorganize in response
- Can occur after serious damage esp. in young children
- Deaf/blind people have enhanced senses bc the disabled senses space is taken over by others
- Brain may try and mend itself by generating new cells (neurogenesis)

Our Divided Brain
- Seizures thought to be the result of amplification of abnormal brain activity between two hemispheres
    - Sever the corpus collasum (band of axon fibers connecting two hemi) to stop seizures
- Left side of visual field = transmits to right hemisphere -> motor
- Right side of visual field = transmits to left hemi -> speech
- Left side (when not comprehending why they're doing something) invents explanations

Right-Left differences in the intact brain

- Perceptual tasks = right hemi
- Speaking/calculating = left hemi
- Right hemi: making inferences, copying, recognizing, emotion, modulate speech to be clear, self-awareness

Brain States & Consciousness

November 22, 2017 11:13 AM

Defining Consciousness:

- Psychology was originally "description and explanation of consciousness"
- First half of 20th century: difficulty of studying consciousness = many psychologists (including behaviorists) to turn to direct observations
- 1960s- psych lost "consciousness" and became study of behaviour
- After 1960s- mental concepts resurfaced, psychologists focused on cognition/mental processes
- Definition: "awareness of ourselves and environment"
    - Allows us to assemble info from sources/reflect/plan
- Evolutionary psych: consciousness has evolutionary reproductive advantage: helps you cope with new situation, act in long term interest (instead of prioritizing short term pleasure), promotes survival by allowing us to understand how others perceive us
- Unsolved mystery: how do brain cells create awareness? How does it come from the brain? - life's deepest mystery

Biology of Consciousness

- Cognitive Neuroscience:
- Mind is what the brain does
    - How does it do it?
- Cognitive neuroscience definition: study of link between brain activity and mental processes
    - Relates brain states to conscious experiences
- Cognitive NS explore/map functions of cortex - based on cortical activation patterns -> can read your mind
- Some scientists believe consciousness arises from synchronized activity across the brain
- Stronger stimulus engages other brain areas

- Dual processing: Two Track Mind
- Humans have 2 minds, each support by its own neural equipment
- Much of our brain work occurs subconsciously
- All processing occurs on two levels -> deliberate high road (reflective) and automatic (intuitive) low road -> dual processing
- Blindsight: condition in which a person can respond to visual stimulus , without consciously experiencing it
- Vision is a dual processing system:
    - Visual perception track: enables us to think about the world, recognize things and place
    - Visual action track: guides moment-to-moment mvm
- Consciousness/perception of a decision happens after the action has been done

Selective Attention:

- Unconscious parallel processing = faster than sequential conscious processing -> both are essential
- Parallel: routine business, simultaneous, natural mode of info processing
- Sequential: solving new problems, focused attention
- Consciousness is nature's way of keeping us from thinking and doing everything at once
- Selective attention: awareness focuses on one aspect of all that you experience
    - 5 senses take 11 000000 bits of info/ sec -> only process 40
- Minds unconscious track makes use of the rest
- Cocktail party effect: listening to one voice among many -> speaking someone's name breaks this effect

- Selective Attention and Accidents

- Multi tasking = attention shifts back and forth -> brain activity reduced by 37% while talking and driving
- Distraction of cell phones is more cognitive than visual (hands free doesn't really help)

- Selective Inattention:
- We are blind to all but a v small amount of visual stimuli
- Inattentional blindness: when fused on one thing -> can ignore other v bizarre things (monkey/woman on the basketball court)
- Inattentional deafness: failing to hear other noises when focused on one (man among women)
- Change blindness: form of inattentional blindness, something in field of vision changes but is not noticed bc of focus on doing something
- Choice blindness: asking people to chose a photo, then switching the photos and asking them to explain why they had chosen it ; people often fail to notice the switch (13% notice)
- Change deafness: when listening to a list of words, people fail to notice a change in who is speaking
- Pop out phenomenon: strongly different stimuli commands attention -> if the male interviewer changes to a woman

Sleep

November 22, 2017 11:49 AM

5 false statements:

- Peoples limbs move if they dream of a certain activity
- Older people sleep more than young adults
- Sleepwalkers are acting out a dream
- Sleep experts recommend sleeping pills for insomnia
- Some people dream every nights and others rarely do

Biological Rhythms and Sleep

- Circadian Rhythm:
- Our body's are synced to a 24 hour day cycle due to biological clock (circadian rhythm)
    - As morning approaches: body temp goes up,
    - Dips during early afternoon (siesta)
    - Begins to drop again in the evening
- 20 year old's - performance increases across the day
- Older adults: performance decreases across the day
- Women shift to being larks earlier -> also when they have children/ menopause
- Night owls = smart and creative
- Morning people = better in school, initiative , less depression

- Sleep Stages:
- Consciousness fades as some parts of the cortex stop communicating
- Sleeping brain remains active and his its own bio rhythm
- Sleep stages: 90 mins
- Discovered by Scientist Eugene and young son Armond -> REM sleep
- Electrodes are placed in:
    - Scalp = brain waves
    - Chin = muscle tension
    - Corners of eye = eye mvm
    - Also: HR, respiration rate, genital arousal
- REM sleep: recurring sleep stage w/ vivid dreams (paradoxical sleep), muscles are relaxed, other body systems still active
- Waking beta waves: awake and alert state
- Waking alpha waves: awake and relaxed state
- NREM 1 (lasts 1-10mins): slipped into sleep, irregular brain waves, slower breathing (stage 1)
    - Brief period, can experience hallucinations, sensation of falling, floating weightlessly (hypnagogic sensations), can later be incorporated into memories , unaware of falling asleep
- After relaxing more deeply -> NREM 2 (lasts 20 mins) -> periodic sleep spindles (rapid, rhythmic brain activity in bursts), clearly asleep, can be awakened w/out too much difficulty
- NREM 3 (lasts up to an hour, starts after having been asleep for 35-45 mins) -> slow wave sleep, large slow delta waves are emitted, hard to awaken, children may wet the bed at the end of this sleep stage

- REM sleep
- An hour after falling asleep, you move into REM sleep
- For 10 mins: brain waves are more rapid (similar to NREM 1 sleep)
    - Unlike NREM1 -> HR rises, breathing is rapid and irregular, every 30s closed eyes dart around
- Eye mvm signal beginning of dream
- Genital become aroused (except during scary dreams) -> regardless of dream content
- "morning erections" -> stem from the REM period and often outlast is by 30/45 mins

- Brains motor cortex is active during REM sleep, but brainstem blocks messages
    - Leaves muscles relaxed (almost paralyzed)
    - Become almost impossible to wake -> immobility can outlast REM sleep -> sleep paralysis
- Cycle repeats every 90 mins for younger adults (more frequent for older)
- As night goes on deep NREM 3 sleep gets shorter and eventually disappears, REM and NREM2 get longer
- By am: 20/25% of sleep (100 mins) has been in REM sleep

- Sleep Patterns:
- Idea that everyone needs 8hr of sleep is untrue - newborns sleep 2/3 of the day, adults only 1/3
- Genetically influenced (twins have similar patterns)
- culturally influenced
- Bright lights impact circadian clock -> activate light sensitive retinal proteins
    - Retinal proteins active suprachiasmatic nucleus -> grain of rice sized, 10 000 cell clusters in hypothalamus (pair)
    - SCN acts by stimulating pineal gland to decrease/increase production of sleep inducing hormone melatonin
- Young adults have a 25hr day due to increased exposure to artificial light

Why do we sleep?

- Sleep functions:
- Sleep protects: during time of hunter-gatherer society -> being out at night was dangerous
    - Sleep depends on a species ecological niche
- Sleep helps recuperate: restores immune system and repairs brain tissue
    - Bats/animals w/ high metabolism produce free radicals (toxic to brain) -> sleeping allows repair
- Sleep restores and rebuilds memories: consolidates, reactivates recent experiences stored in hippocampus and shifts them to permanent storage
- Sleep feeds creative thinking: dreams = artistic inspiration, boost that comes from sleep improves thinking and learning
- Sleep supports growth: during deep sleep -> PG releases GH for muscle development -> w/ age we spend less time in this period and release less of this hormone
- REM & NREM2 (occur towards end of the night) strengthen neural connections that build enduring memories -> muscle memory for sports
- Best exercise time : late afternoon/early evening -> efficient cooling period
- Exercise for precision sports (basketball shooting) -> night time

Sleep Deprivation/Disorders:

- Effects of sleep loss:
- Sleep debt can be accumulated -> 2 weeks
- Sleep loss is predictor for depression :
- Causes difficulty studying, diminished productivity, mistakes, irritability , weight gain
- Sleep loss causes weight gain by:
    - Increasing ghrelin (hunger hormone) and decreasing leptin (hunger supressing hormone)
    - Decreases metabolic rate
    - Increases cortisol (stress hormone that stimulate fat production)
    - Enhances limbic brain responses to sight of food and decreases cortisol inhibition
- Impacts physical health:
    - Supresses immune cells that battle infection
    - Slows reactions and increased in visual attention tasks and reactions in operating mechanical equip (bc of sleepy frontal lobe)
    - Joints: increased inflammation and arthritis

    - Muscles: reduced strength and slow reaction time + motor learning
    - Heart: increased risk of high BP

- Major Sleep Disorders;

- Insomnia : persistent problems in falling asleep and staying asleep
    - Most common fixes (sleeping pills and alcohol) can aggravate the problem -> reduce REM sleep, and lead to tolerance
- Narcolepsy: attacks of sleepiness (last less than 5 min), run in families
    - Extreme cases : fall into brief REM sleep
    - Caused by genes that attack brain cells enabling alertness
    - Absence of hypothalamic neural center that produces orexin (alertness NT)
- Sleep apnea: periodically stop breathing and then lack of oxygen triggers a gasp of air causing a snore sound
    - Linked with obesity , daytime sleepiness, irritability, high BP
- Nigh terrors: target children, do not wake up fully (may talk, walk and cry), and do not recall the episode in the am, occur during NREM 3, within 2/3 hours of falling asleep
- Nightmares occur in early am REM sleep
- Sleep walking: NREM3 sleep disorder, sleep talking occurs @ any stage, childhood disorders, run in families, young children have deepest and lengthiest NREM3 -> experience most

Dreams

November 22, 2017 4:38 PM

What we dream:

- Daydreams - personal familiar details of life
- REM dreams: vivid, emotional and bizarre

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- 6yrs of life is spent in dreams
- 8 in 10 is negative
- 1 in 10 v 1 in 30 are sexual
- Dreams story line usually incorporates the previous days experiences
    - After trauma = nightmares
    - People in country side dream more often of animals (2x)
    - Musician dreams more often of music (2x)
    - Blind people dream of other senses
- 2 track mind monitors environment while you sleep -> outside stimulus can be incorporated into a dream
- People forget things that happened 5 mins before sleep

Why we dream:

- Dream theorist propose:
    - To satisfy our won wishes: Freud believes that dreams are an outlet for unacceptable feelings -> manifest content is a censored version of the latent content , considered them key to inner conflicts, widely discredited
    - To file memories: info processing perspective propose that dreams sift, sort and fix experiences into memory, confirmed link between REM sleep and memory, could have no relation to dreaming specifically ->why do we have dreams about things we've never experienced
    - Develop and preserve neural pathways: physiological function through stimulating the sleeping brain, preserves and expands pathways -> but why do we sometimes have meaningful dreams if they are simply a Phys function?
    - Make sense of neural static: dreams come from neural activation spreading from brainstem, activation synthesis theory: brain is attempting to synthesize neural activity, internal stimulus activates visual processing centers -> the stories of dreams are meaningful and tell us something about the dreamer, therefore how can they be random
    - To reflect cognitive development: seen as part of brain maturation and development, top down control, dreams become increasingly complex and story-like, -> what is the adaptive function?

- When deprived of REM sleep, people will return to it quicker when falling back asleep
    - If allowed continuous sleep -> increased REM sleep -> REM rebound

Drugs and Consciousness

November 22, 2017 4:58 PM

Tolerance and Addiction

Addictive drug = psychoactive drug: chem substance that alters perception and mood
Impact of drug depends on biological effects, social and cultural contexts

Tolerance: increased resistance to the impact of a substances due to continued use
- Happens when brains chemistry adapts to offset the drugs effect -> neuroadaptation
- Ever increasing does = addiction
- Abruptly quitting = withdrawal symptoms

Types of Psychoactive Drugs:

3 major categories: depressants, stimulants and hallucinogens -> do their work at brains synapses by stimulating/inhibiting/mimicking the brains own chem messengers (NT)

- Depressants:
- Alcohol, barbiturates (tranquilizer),opiates -> calm neural activity and slow body functions
-
- **Alcohol**:
    - False: in small amount alch is a stimulant -> enlivens ppl by acting as a disinhibitor (slows control of judgement and inhibitions)
    - Equal opportunity drug: increases/disinhibits helpful tendencies and increases harmful tendencies
- Slowed neural processing:
    - Low alch dose = relaxed sym NS
    - Large dose alch: slowed reactions. Slurred speech, deterioration of performance
    - When paired w/ sleep deprivation = potent sedative
    - Moderate drinking followed by heavy drinking = alch poisoning as moderate drinking has supressed the urge to throw up
- Memory disruption:
    - Alch can disrupt memory formation
    - Long term heavy drinking = long term impact on brain/cognition
        - Nerve cell death and reduces birth of new ones
        - Impairs growth of synaptic connections
    - Black outs results partly from how alch supresses REM sleep (fixes memories)
    - Prolonged/excessive drinking (alcohol use disorder) = brain shrinking, women are more vulnerable (have less of alch digesting enzymes)
        - Greater rick for women of lung/brain/liver damage @ lower consumption levels
- Reduced Self awareness and Control
    - Reduces awareness of ur own activity (you zone and out and don't even realize it)
    - Produces "myopia" -> focusing attention on arousing situation and distracts from normal inhibition/conseq
    - Reduced self awareness = unhappy alcoholics
- Expectancy effects:
    - Thinking you have consumed alcohol -> will behave accordingly
    - Attribute actions to alch consumption

- **Barbiturates**:
    - Depress NS activity
    - Nembutal, seconal, amytal -> prescribed to reduce anxiety and induce sleep
    - Large doses = impaired memory and judgement

    - Can be lethal when combined w/ alcohol

- **Opiates**
    - Opium + derivatives (heroin)
    - Depress neural functions
    - Pupils constrict, breathing slows, lethargy sets in -> blissful pleasure replaces pain/anxiety
    - Long term price: cravings for another fixe, increasing tolerance, withdrawal
    - When repeatedly flooded with artificial opiates -> brain will stop producing endorphins (natural opiate) -> when opiate is withdrawn, brain lacks normal painkilling NT
    - Include narcotics -> codeine and morphine, methadone

- Stimulants:
- Excites neural activity, speeds up body functions, pupils dilate, HR increases, blood sugar level rises -> drop in appetite, increased energy and self confidence
- Caffeine, nicotine, amphetamines, cocaine, methamphetamine (speed), ecstasy
- Used for feeling alert, losing weight, boosting mood/athlete performance
- Withdrawal = fatigue, headaches, irritability, depression

- **Nicotine**:
    - Teen to grave smoker = 50% chance of death
    - 1 cigarette = 12 mins of life (10 year shorter life expectancy)
    - Powerfully and quickly addictive
    - Within 7 sec nicotine rushes to brain and signals NS to release NT -> epi/norepi -> diminish appetite and boost alertness/mental efficiency
        - Dopamine and opioids: calm anxiety and reduce pain
    - Half of Americans who have ever smoked have quit
    - Quitting: cravings dissipate over 6 months

- **Cocaine**
    - Fast track from euphoria to crash
    - Enters bloodstream quickly, produces rush of euphoria -> depletes brain storage of dopamine, serotonin and NE -> within an hour, a crash ensues
    - Situations that rigger aggression are aggravated by cocaine
    - Can also lead to emotional disturbances, suspiciousness, conclusions, cardiac arrest, repository failure
    - Crack -> faster working, crystal version of cocaine w/ a stronger high (more brief) and more intense crash -> craving disappear and return after days
    - Depends on dosage, form consumed, situation, users expectations/personality

- **Methamphetamine**:
    - Chem related to parent drug amphetamine but w/ greater effects
    - Triggers release of dopamine -> stimulates brain cells that enhance energy and mood -> eight hours of euphoria
    - Aftereffects: irritability, insomnia, hypertension, seizures, isolation, depression, violent outbursts
    - Over time can reduce baseline dopamine level -> results in continued depressed functioning

- **Ecstasy**:
    - Street name for MDMA,(molly when in powder)
    - Stimulant + mild hallucinogen
    - Amphetamine derivative
    - Triggers dopamine release, major effect is releasing stored serotonin and blocking reuptake -> prolonging feel good flood

    - Half an hour wait before it kicks in
    - Lasts 3/4 hours -> high energy, emotional elevation, connectedness
    - 1990s- Club drug
    - Dehydrating effect: when combined with prolonged dancing = severe overheating, increased BP, death
    - Long term, repeated leeching of brain serotonin can damage serotonin producing neurons -> decreased output and permanently depressed mood
    - Suppresses immune system, impairs memory, slows thought, disrupts sleep by interfering with serotonins control of circadian clock

- Hallucinogens
- Distort perception and evoke sensory images in the absence of sensory input , LSD, MDMA + natural substances (weed)
- Brain hallucinates same ways regardless of stimulant/cause
- Typically begins w/ simple geometric forms, then more meaningful images (tunnels or emotional experiences), then @ peak -> people feel separated from body's, experience dreamy scenes so real they may panic/harm themselves
- These sensations are similar to near death experience -> altered sate of consciousness reported by 10/15% of patients revived from cardiac arrest

- **LSD**:
    - Created and accidently ingested by Albert Hoffmann
    - Creates uninterrupted stream of pictures, shapes, kaleidoscopes, colours
    - User mood and expectations color the experience -> euphoric, panic, detachment

- **Marijuana**
    - Marijuana leaves and flowers contain THC
        - Smoking-> gets to bray in 7 sec
        - Eaten -> slower, unpredictable release
    - Mix of effect:
        - Synthetic marijuana (K2/spice) -> mimics THC
        - Agitation and hallucination
    - Mild hallucinogen, amplifies sensitivity to colour, sound, taste and smell
    - Relaxes, disinhibits, euphoria
    - Impairs motor coordination, perceptual skills, reaction times
    - THC and biproducts remain in the body for a week-> regular users have less abrupt withdrawal and don't develop tolerance as quickly (may need smaller amounts to get high)
    - Experience varies with situation
    - More use = more risk of anxiety, depression, addiction (esp. adolescents)
    - Disrupts memeory formation and immediate recall -> outlast period of smoking
    - Heavy adult use for over 20 years = shirnkage of brain areas that process memories and emotions (typically for those who start before 18 years old)
    - Prenatal exposure impairs brain development

Influences on Drug Use:
- Drug use among north american use increased in 1970s
- With increased education and deglamorizing - drops dramatically in
- After 1990s some drugs became glamourous again (weed)

Biological influences:
- Some are predisposed to be vulnerable
- Hereditary (esp. for early adulthood)
- Adopted individual w/ a bio parents that has a history = greater risk
- Twins mimic other twins actions
- Boys who at 6 years old are excitable, impulsive and fearless (genetic) are more at risk

- Reduced levels of the brain chemical NPY
- Some genes are more common among those w/ alch disorder -> produce deficiency in brains natural dopamine rewards system

Psychological/ Socio-cultural Influences:

- Feeling that life us meaningless and w/out direction
- Significant stress/failure/ depression
- Girls w/ history of depression, eating disorder, abuse
- Youth undergoing neighborhood/school transition
- College students w/out clear identity
- smoking being usually in early adolescence (past college age are v low risk)
    - Adolescents may smoke to seek glamour, project an image, handle stress, social acceptance
- Teen drinking = social
- Drug use vary w/ culture and ethnicity
    - Low in Romania/ Sweden
    - 20-22 % in BR, FR and SZ
    - Low rates of drinking among African American teens
    - V low among religious

Basic Concepts

November 22, 2017 6:51 PM

Basic Concepts of Sensation & Perception:

- Heather Seller: sensation is normal -> can detect all visual info
    - Perception: cannot organize the info to recognize who it is by only visual sensation
- In every day life sensation/perception blend into one continuous process
    - Bottom-up processing: starts at sensory receptors and works up to higher levels of processing
    - Top down processing: const5ructs perceptions from sensory input by drawing on our experiences and expectations
    - Bottom up -> sensory system detects lines, angles, colour that form a flower
    - Top down -> interpret what senses detect

Transduction:

- All senses
    - Receive sensory info using specialized cells
    - Transform stimuli into neural impulse
    - Deliver neural info to our brain
- Definition: converting one form of energy to another -> transforming stimulus energies into neural impulses
- Psychophysics: study of relationships between physical characteristic of stimuli (intensity) and experience of them

Threshold :

- Absolute: min stimulus energy needed to detect it 50% of the time
- Signal detection theory: theory predicting how and when we detect the presence of a faint stimulus (signal) amid background stimuli (noise)
    - Assumes there's no single absolute threshold and that detection depends partly on experience, expectations, motivation, alertness
- Absolut threshold:
    - Candle flame from 48 km
    - Wing of a bee falling on our cheek
    - Smell single drop of perfume in 3 room apartment
    - Gustav Fechner (German)
- Signal detection:
    - Seek to understand why people respond differently
    - Predicts when we will detect weak signals (ratio of Hits: false alarm)
- Subliminal: stimuli you cant detect 50% of the time
- Priming: activation, subconsciously, of certain associations -> predisposes perception, memory or response
- Stimulus only reaches consciousness when it triggers synchronized activity in multiple brain areas

- Difference thresholds:
- Define: min diff between two stimuli required for detection 50% of the time -> just noticeable difference (jnd)
- Ernst Weber: min percentage (not amount) difference between two stimulus for the average person to perceive a difference
- Light = 8%, weight = 2%, tone = 0.3%

Sensory Adaptation:

- Constant exposure to unchanging stimulus, we become less aware of it bc your nerve cells fire less frequently
- Doesn’t apply to eyes bc they are constantly moving
- Pro: gives u freedom to focus on informative changes in the environment without being

distracted
- We don’t perceive the world exactly as it, we perceive it as it is useful to
- Explains camera shot variety in tv

Perceptual Set
- Set of mental tendencies and assumptions that affects (top down) what we process

Context effects:
- Immediate context triggers different perception
- Phenomenon of assuming others are armed bc you are
- Phenomena where the brain allows later stimulus to determine how we perceived the earlier one

Motivation and Emotion
- Emotions impact how you perceive neutral stimuli: morning v mourning
- Motives: desired objects seem closer,

Vision: Sensory & Perceptual Processing

November 24, 2017 3:22 PM

Light Energy and Eye Structures

- Stimulus Input: Light Energy
- Colour = pulses of electromagnetic that your visual system perceives as a colour
- Visible light = small amount of the spectrum of electromagnetic energy (v short gamma rays- long waves of radio transmission)
- 2 Phys characteristics of light determine sensory experience:
    - Wavelength: distance from one wave peak to another-> determines hue (colour we experience)
    - Intensity: amount of energy in light waves (determined by amplitude) -> determines brightness
- Eye:
- Cornea: light enters here, blends light to help provide focus
- Pupil: light passes by here second-> small adjustable opening
    - Iris: surrounds and controls size of the pupil -> colored muscles that dilates/constricts in response to light intensity
    - Responds to cognitive and emotional state -> negative feeling (constrict) -> each iris is one of a kind
- Lens: behind pupil, transparent, focuses incoming light rays into an image on the retina
    - Accommodation: changing curvature and thickness to focus rays
- Retina: multilayered tissue on eyeballs sensitive inner surface
    - Retina receives upside down images of the world
    - How do we see the world right side up?
        - The retina doesn't see the whole image, the receptor cell convert the particles of light energy into neural impulses and send them to the brain

Information Processing in the Eye and Brain:

- Retinal Processing
- Enter the retinas sparse layer of outer cells
- Reach back of eye -> buried receptor cells (rods and cones)
    - Light energy would trigger chem changes -> chem rxns sparks neural signals, activating nearby bipolar cells
    - Bipolar cells activate neighboring ganglion cells
        - Axons twine together to form optic nerve
        - Optic nerve brings info to thalamus
        - Can send 1 mill messages @ once
- Blind spot: spot where optic nerve leaves the eye, no receptor cells
- Cones: cluster in/around fovea -> retinas area of central focuses
    - Each cone transmits to a single bipolar cell-> cell relays singe message to visual cortex -> devotes large area to input from fovea -> direct connections preserve the cones' precise info, better able to detect fine detail
- Rods : share bipolar cells and send combined messages, -> why images in ur peripheral are blurred
- Cones-> perceive colour ->
- Rods -> enable black and white vision in darkness -> funnel faint energy into single bipolar cell
- Eyes adapt to darkness by dilating pupils (takes 20 mins)
- Processing of info :
    - After processing by 130 mill rods/cones, info goes to bipolar cells
    - Moves to eyes million gang cells and through axons that make up optic nerve
    - After momentary stop in thalamus, info travels to visual cortex (specific locations)

- Pressure can trigger retinal cells

- Colour processing:
- If no one sees a tomato is it red? NOOOOOOOOOOOOOOO
    - Tomato is everything but red (it reflects red)
    - Tomato colour is mental construction
- Eye has 3 corresponding colour receptors -> Young-Helmholtz trichromatic theory
    - Theory that retina contain 3 diff colour receptors (red, green, blue) which when stimulated in combination can produce the perception of any colour
- Colour blind: lack functioning red/green sensitive cones
- Primary colour have opposite colour (red-green, yellow blue, white-black)
- 2 stages of colour processing:
    - Retinas colour cones respond in varying degrees to diff stimuli
    - Cones responses are processed by opponent process cells

- Feature Detection:
- Definition: nerve cells in the brain that respond to a scene's specific features -> edges, lines, angles, mvm
    - Located in the occipital lobe of the visual cortex, receive info from individual gang. Cells in retina
    - Feature detectors pass this info to other cortical areas, where teams of cells (supercell clusters) respond to more complex patterns

- Parallel Processing
- Processing of many stimuli at once, natural mode of the brain
- To analyze a visual scene, the brain splits it into subdimensions (motion, form, depth colour), and works on each aspect simultaneously
- Grandmother cells: respond selectively to one or 2 faces (recognize certain people)
- Facial recognition requires 30% of cortex power

Perceptual Organization

- German psycho -> realize that people always try to organize things into a whole (gestalt-> German word for whole)
- Ex: Necker cube

- Form and Perception:
- Figure and Ground:
    - Inclination to perceive the figure as sperate from the background
- Grouping:
    - Organizing the figure into meaningful form
    - Proximity: nearby figure
    - Continuity : smooth continuous patterns
    - Closure: filling in gaps to create a whole object

- Depth Perception
- Allows us to estimate an objects distance from us
- Partly innate
- Visual cliff: laboratory device for testing depth perception in infants and animals
- Binocular cues:
    - Depth cues, retinal disparity, that depend on the use of two eyes
    - Retinas receive slightly diff images due to their distance apart -> by comparing the 2 images, your brain can judge distance
    - Great retinal disparity/diff between two images = closer an object is
- Monocular cues: depth cues available to each eye separately
    - Relative height: higher in your field of vision = farther
    - Relative motion: further the object is from your fixation point = faster it will seem to

move
    - Relative size: smaller = farther
    - Linear perspective: sharper the angle of convergence = greater the distance
    - Interposition: one object blocks our view of another = closer
    - Light and shadow

- Motion Perception:
- Young children don't have a fully developed concept of motion (enlarging object are acc approaching and demining objects are retreating)
- Large and small objects moving at same speed -> large object appears to move slower
- Brain perceives blinking of adjacent lights in quick succession as movement -> phi phen.

- Perceptual Constancy:
- Perceiving objects as unchanging despite changing illumination and retinal images
- Colour and Brightness Constancies:
    - Experience of colour depends on context
    - Color constancy : perceiving objects as having the same colour despite changing illumination having altered wavelengths reflected
    - Brightness/lightness constancy: perceive an object as having constant brightness even while illumination varies -> perception of constancy depends on relative luminance (relative light an object reflect relative to its surroundings)
    - The colours we perceive and their brightness depends on the object surrounding them that we can compare to
- Shape and Size Constancies:
    - Sometimes objects shapes seem to change (even f they cant)
    - Shape constancy: perceiving the form of familiar objects the same despite our retinas receiving changing images (achieved thanks to visual cortex neurons that learn to associate diff views of an object)
    - Size constancy: perceive objects as having the same size even when distance varies

Perceptual Interpretation

- Experience and Visual Perception:
- Perceptual adaptation: ability to adjust to an artificially displaced/ inverted visual field (glasses)

The Nonvisual Senses

November 24, 2017 8:28 PM

Hearing:

Audition = act/sense of hearing
Much faster than other senses

- Stimulus Input : Input
- Amplitude of sound waves = loudness
- Length/frequency: pitch we hear
- Decibels: sound measurement -> 0db = absolute threshold for hearing
    - Every 10 db.= tenfold increase in sound intensity

- The Ear:
- Sound enter outer ear -> visible outer ear channels waves through the auditory canal to the eardrum (tight membrane) causing it to vibrate
- In the middle ear: chamber b/ween eardrum and cochlea, containing 3 tiny bones (hammer anvil and stirrup) that concentrate vibrations of the eardrum on the cochlea's oval window in the inner ear
    - A piston made of the 3 tiny bones picks up the vibration and transmits them to the cochlea
- Inner ear: contain cochlea, semicircular canals and vestibular sacs
- Cochlea: coiled, bony fluid filled tube in the inner ear, sound waves traveling through the cochlear fluid trigger nerve impulses
    - The incoming vibrations cause the cochlea's membrane (oval window) to vibrate, jostling the fluid that fills the tube -> motion causes ripples in basilar membrane
    - Bends hair cells lining the surface of BM -> hair cell mvm triggers impulses in adjacent nerve cells
    - Axons of those cells converge to form the auditory nerve -> sends neural messages via the thalamus to the auditory vortex in temporal lobe
- 16 000 hair cells -> damage causes sensorineural hearing loss (nerve deafness) -> damage to cochlea's receptor cells/auditory nerves
- Conduction hearing loss: less common, damage to the mech system of sound wave conduction

- Perceiving loudness, pitch and location
- Responding to loud and soft sounds:
    - Brain interprets loudness by the # of hair cells activated -> everyone perceives loud noises the same, it is soft sounds that differ between hearing and hard of hearing people
- Hearing diff Pitches:
    - Helmholtz's place theory: hear diff pitches bc diff sound waves trigger activity at diff places along the cochlea's BM -> doesn’t explain how we can hear low pitch sounds
    - Frequency theory/temporal theory: brain read pitch by monitoring freq of neural impulses travelling up auditory nerve -> a neuron can only fire 1000x/second, so how can we sounds with freq higher than 1000
    - Volley principle: neural cells alternate firing-> firing in rapid succession they can achieve a combined freq of above 1000
    - Therefore:
        - Place theory = explains high pitched
        - Freq theory explains low pitch
        - Combo: pitches in the middle
- Locating Sounds:
    - Placement of 2 ears= stereophonic (3D) hearing

The Other Senses:

- Touch:
- Sense of touch is a mix of: pressure, warmth, cold pain

- Pain:
- Protects us by letting us know something is wrong
- Understanding Pain:
    - Women are more sensitive (as well as hearing and smell)
    - Reflects bottom up and top down processing
    - Biological influences:
        - Diff types of nociceptors-> detect hurtful temp, pressure chem-> present in skin, muscles, organs
        - Gate control theory: spinal cord contains a gate that is opened when tissue is injured and small fibers activate = pain
        - Large fiber activity/brain signals closes the gate and blocks pain signals from reaching the brain -> treating chronic pain by simulating gate closing activity in large fibers (massage, acupuncture)
        - Phantom limb sensation: pain in non-existent limbs
            - Hearing less version: tinnitus (ringing in the ear for deaf ppl)
    - Physiological Influences:
        - Attention we focus on pain
        - We record our pains peak moment and how much pain we felt at the end
    - Sociocultural experiences:
        - Varies w/ social situation and cultural tradition
        - We perceive more pain if others also perceive it
- Controlling Pain:
    - Pain distraction (psycho influence) + soothing release of natural pain killing endorphins (biological)
    - Placebos: fake medicine triggers the brain to produce endorphins -> reduced pain
    - Distraction : pleasant images/ drawing attention away

- Taste:
- Basic sensations: sweet, sour, salty, bitter, umami (MSG)
- Pleasant taste -> attracted ancestors to good food for survival
- Bad tastes = deterred them from new potential harmful food
    - Why younger children are fussy eaters
- Inside each bump on tongue (side and top) = 200 taste buds -> each contains a pore that catches food chem -> each pore contains 50/100 taste receptor cells w/ antenna like hairs that sense food mlcs
    - Reproduce every week, number of taste buds/taste sensitivity decreases with age -> accelerated by smoking and alch
- Expectations are a factor

- Smell
- Chem sense
- Mlcls of substances in the air are carried to tiny cluster of 20mill receptor cells at the top of each nasal cavity
- They have antenna like projections -> immediately alert the brain through axon fibers -> they are primitive sense and therefore bypass the thalamus and communicate directly w/ brain
- Odor molecules have receptor proteins embedded on the surface of nasal cavity
- Diff combos of olfactory receptors = dif smells
- Gender and age have an influence-> women/young adults are more sensitive
- Declines with age after peak in early adulthood

- Body Position and Movement
- Kinesthesia: the system for sensing the position and mvm of your body parts
- Not having these sense due to nerve damage = disembodied feeling

- Vestibular sense: sense of mvm and position (balance)
    - Managed by 2 structures in inner ear
        - Semicircular canals : 3d pretzel shape,
        - Vestibular sacs; connect canals with cochlea, containing fluid that moves when your head rotates/tilts -> this mvm stimulates hair like receptors-> sending messages to cerebellum -> sense body position and maintain balance

Sensory Interaction:

- One sense can influence another: smell + texture + taste = flavour
- Weak flicker of light + short sound = more noticeable
- Hearing and seeing two diff things = blended combo of the 2 -> created a third sound/image
- Embodied cognition: influence of bodily sensations/gestures on cognitive preferences and judgement -> sitting at a wobbly table makes others relationships seem less stable, holding a warm drink leads to perceiving ppl as warm
- Synthesis: one sensation (sound) produces another (seeing colour)

Basic Learning Concepts & CC

November 25, 2017 11:37 AM

How do we learn?

- Definition: process of acquiring, through experience, new info or behaviours
- By learning: we can adapt to environ, expect/prepare for events, repeat rewarding acts and avoid punished ones,
- Locke, Hume and Aristotle: learn by association
- Average time to form a habit: 66 days
- Associative learning: learning that certain events occur together. The events can be 2 stimuli (CC) or a response ad consequence (OC)
    - Anticipating immediate future
- Observational learning: form of cognitive learning, learning from others experiences
- Cognitive learning: acquiring mental info by observing, watching or language

Classical Conditioning:

- Ivan Pavlov
- 20th century experience
- Lays foundation for Watson's ideas
    - Behaviourism: view that psychology should be an objective science hat studies behaviour w/out reference to mental processes-> most ppl agree with objective but no "w/out mental processes"
    - Influenced psych through first half of 20th century
- Pavlov's Experiments:
- Began as an accidental observation where the dog would salivate at the sight of food, person, sounds
- Explored 5 major conditioning processes: acquisition, extinction, spontaneous recovery, generalization , discrimination
- CS, NS, CR, UR, US
- Acquisition: first step of CC
    - Initial learning
    - How much time between stimuli ? Half a second
    - Conditioning doesn't happen if US comes before the NS
    - Biologically adaptive bc it allows organisms to prepare for good/bad events
        - Helps an animal survive and reproduce-> responding to cues that help it gain food, avoid danger, locate mates and produce offspring
    - Higher order conditioning: a new NS can become a CS by being associated with an already established CS-> second order CS is weaker than the first order
- Extinction and Spontaneous recovery
    - If the CS appears without the US, the response will get weaker and weaker until it stops -> extinct
    - If several hours go by, and the CS become followed by the US again, the salivation would restart (quicker than it took for the first association) -> spontaneous recovery
        - Suggest that extinction only suppressed CR, not eliminate
- Generalization:
    - Responding similarly to stimuli similar to CS
    - Adaptive -> when toddler fear moving cars, also start fear motorcycles and trucks
        - Generalized fear
- Discrimination:
    - Learned ability to distinguish between CS and irrelevant stimulus
    - Recognizing differences = adaptive (diff stimuli has v diff consequences -> guard dog v guide dog)

- Pavlov's Legacy
- A great ideal remains
- Ideas are seen incomplete today
- Remains important as:
    - Many other responses to many other stimuli can be CC in other organisms
        - One way that virtually all organism learn to adapt to environ
    - Showed how a process like learning can be studied objectively
- Applications of CC:
    - Provided a basis for Watsons ideas that human emotion/behaviour is mainly conditioned responses
        - Made a little boy "Little Albert", afraid of all white animals by associating white rabbits with loud, scary sounds
        - Unethical by todays standards

Operant Conditioning

November 25, 2017 12:06 PM

Differences:

- CC= forms associations w/ stimulus & involves respondent behaviour (automatic responses to stimulus)
- OC = forms association b/ween their own actions and conseq -> reinforcers increase, punishments decrease, behaviour operates on the environment to produce reward/punishment

Skinners Experiments:

- College English major
- Modern behaviorisms most influential and controversial figure
- Elaborated on law of effect: Thorndike's principle that behaviour followed by good conseq become more likely, and those followed by bad conseq are less likely
- Developed behavioural tech that revealed principles of behaviour control
    - Shaping: operant conditioning procedure in which reinforcers guide behaviour toward closer and closer desired behaviour
    - By shaping the behaviour of pigeons (walking and pecking0 he made them learn to walk in a figure 8, play ping pong, keep missiles on course
- Designed an operant chamber: skinner box
    - Has a bar/ key for the animal to press that releases a reward (food/water) + device that records responses
    - Stage to act out the principle of reinforcement-> any event that strength the behaviour it follows

- Shaping Behaviour:

- Watch the animals behaviour -> build on its natural tendencies
- Use successive approximation -> rewards for gradual progress
- Discriminative stimuli: signals that a response to it will be reinforced

- Types of Reinforcers:

- Positive: strengthens response by presenting a typically pleasurable stimulus
- Negative reinforcement: strengthens response by reducing/removing something negative
- Can coincided
- Primary and Conditioned Responses:
    - Primary = unlearned/biological (removing headache, getting food when hungry)
    - \conditioned reinforcers/secondary: learned association with a primary reinforcer -> money
- Immediate & Delayed Reinforcers: delay between action and reinforcement is longer than 30 sec -> rat will get confused and will have moved on to other actions
    - Humans can respond to delayed reinforcements: good grades, paycheque
    - Small and immediate conseq can be more alluring that big and delayed consequences

- Reinforcement schedules:

- Pattern that defines how often a desired response will be reinforced
- Continuous reinforcement: reinforcing the response every time it occurs -> Learning is rapid, but when we stop delivering the reward, behaviour will stop
- Partial (intermittent) reinforcement: reinforcement happens only part of the time, slower acquisition but greater resistance to extinction than continuous reinforcement -> best procedure for making behaviour persist
    - 4 types of schedules:
    - Fixed ratio: reinforce behaviour after set number of responses: 1 free drink after 10 purchases = high rate of responding
    - Variable ratio : reinforces behaviour after a unpredictable number of responses: slot

machine: because reinforcements increase w/ number of responses = high rates of responding
    - Fixed interval schedules: reinforce the response after a fixed time period= after purchasing an item online (response), the item will not arrive for 3 days (fixed time period) -> people will get more anxious and check more often as the time period reaches its end -> produces choppy stop start patter, not steady rate of response
    - Variable interval schedule: reinforces first response after varying time: after messaging someone on Facebook (response), the responding messaging will arrive at a random time (variable time period) -> produce slow steady responding (persistently checking Facebook)
    - General rule: response is higher when linked to number of responses, and is more consistent when reinforcement is unpredictable than predictable

- Punishment :
- Decreases a behavior
- Punishments are more effective when swift and sure -> better than the threat of v severe sentences
    - Positive: administer something undesired > giving a traffic ticket
    - Negative-> end something desired -> taking away driving privileges
- 4 Major drawbacks of physical punishment:
    - Punished behaviour will only be temporarily supressed not forgotten -. Temporary state can negatively reinforce parent punishing behaviour
    - Punishment teaches discrimination among situations -> did the child not to swear at all or just not o sweat at home
    - Punishment can teach fear -> generalization may occur -> child will associate fear with swearing but also w/ the parent
    - Physical punishment can increase aggression by modelling aggression as a way to deal with problems
        - Is it possible that children are more aggressive bc of pre-exisiting situations?
        - Phys may be effective if " its only used as a backup when milder tactics fail + swat is combined with reasoning and reinforcing
        - Punishments can become reinforcements when reworded

Skinner's Legacy:

- Encouraged people to use operant principles to influence others
- Critics argued that this was dehumanizing as it neglected their personal freedom by controlling actions
- Skinner argued that if random responses were already controlling ppl -> why not use this principle to better people

- Application of Operant Conditioning
- At school: using adaptive learning software -> computers that can adapt to every students rate of learning, provide immediate feedback and find gaps in understanding -> not yet fully achieved
- In sports: reinforcing small successes and gradually increasing the challenge -> working up to standard procedures, starting small builds confidence -> shows faster skill improvement
- At work : rewarding specific achievable behaviours increases productivity -> should be immediate , not necessarily monetary
- At home: instead of getting angry at children, notice when they do something right and reward it -> don't yell when they do something bad, explain their mistake and give a time out
    - Follow these steps to improve/break habits:
        - State a realistic goal in measurable terms
        - Decide how, when and where you will work towards it
        - Monitor how often you do it
        - Reinforce the desired behaviour
        - Reduce the rewards gradually

Contrasting Classical and Operant Conditioning

- Both are associative learning, both involve acquisition, extinction etc.

Biology, Conditioning & Learning

November 25, 2017 1:23 PM

Biological Constraints on Conditioning

- Limits on CC:
- Each species predisposition prepare it to learn the associations that enhance its survival -> their capacity to learn is constrained by biology
- Rats learned to avoid certain tastes even if the impacts happened hours after -> they also only become condition to taste -> this was a concept called taste aversion -> response that helps rats survive eradication by poison
    - Violates two notions -> US doesn't have to come immediately after CS, and that not any stimulus can serve as a CS
- Humans if they get food poisoning from a food -> develop an aversion to the taste but not the restaurant, plates, people or music
- Taste aversion concept was initially rejected
- Research support Charles Darwin's natural selection principle that traits that aid survival are favoured

- Limits on operant conditioning
- We most easily learn and retain behaviours that reflect our biological predispositions
    - Biological constraint on learning associations
- Instinctive drift: animals drift from their conditioned behaviour to their natural instinct -> animals revert to biologically predisposed patterns

Cognitions Influence on Conditioning

- Cognitive processes and CC
- Animals can learn the predictability of an event
- Using nausea drugs to prevent drinking doesn't work because people are aware
- People form more positive associations if things are presented with stuff the like
- Cognitive processes and OC
- Skinner didn't believe in mental processes -> for him cognitive science = introspections
- Cognitive map: mental rep of the layout of one's environment
- Latent learning: learning that occurs but isn't apparent until there is incentive to demonstrate it
    - There is more to learning than association -> cognition is important too
- Excessive rewarding = intrinsic motivations can be destroyed (no longer wanting to do something well for the sake of it)
- Extrinsic motivation: doing something only for rewards
- Focusing on ur works intrinsic motivations = do better work + more extrinsic rewards
- Extrinsic rewards -> Most improved player awards -> boost competence and enjoyment

Learning by Observation:

- Higher animals (humans) learn without direct experience
    - Process is modeling : observing and imitating specific behaviour -> learning language
- By observing we experience vicarious punishment/reinforcement: learn to anticipate a behaviours conseq in situations by observing others -> especially likely to learn from people like ourselves
- Mirrors and Imitation in the Brain:
- Mirror neurons discovered by Rizzolatti in a monkey experiment: frontal lobe neurons that some scientist believe fire when preforming certain actions or when observing others doing so -> imitation and empathy by mirroring

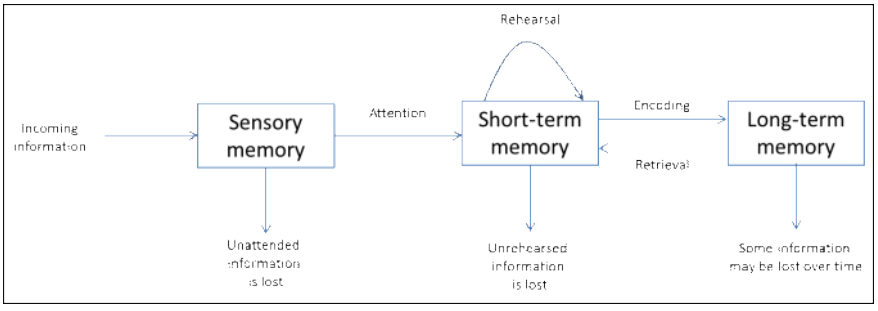
- Applications of Observational Learning:
- Prosocial effects:
    - Prosocial = positive/helpful, business uses behaviour modeling to help employees gain skills faster as they are able to observe the skills
- Antisocial effects:
    - Why abusive parents have aggressive children

Studying and Encoding Memories

November 26, 2017 11:45 AM

Studying Memory

- Definition: peri stance of learning over time through the encoding, storage and retrieval of information

- Measuring Retention:
- 3 measures:
    - Recall -> retrieving info that is not currently in your consciousness -> fill in the blanks
    - Recognition -> identifying items -> multiple choice
    - Relearning -> learning something more quickly the second time -> studying for final exam, engaging in childhood language
- Herman Ebbinghaus: designed experiment where he memorized a string of random syllables and timed how long it took to relearn them on day 2- > Ebbinghaus retention curve
- Memory Models:
- Info processing model (connectionism) -> likens memory to computer operations -> to remember an event we must:
    - Encode: get info into the brain
    - Storage : retain the info
    - Retrieval: get the info back out
- Brain processes many things simultaneously -> parallel processing
- Memories are product of interconnected neural networks -> specific memories = specific activation patterns -> every time you learn something -> brain neural connections change -> forming and strengthen pathways for interaction w/ environ
- Atkinson and Shiffrin's 3 stage model:
    - Sensory memory: first record to-be-remembered info as a fleeting sensory memory
    - Process info into short-term memory -> gets encoded through rehearsal
    - Info moves into long term memory
- 

- Working Memory:
    - Baddeley extends A&S view of short term memory
    - A&S short term memory = small, brief storage space for recent thoughts/experiences
    - However -> its acc an active stage where the brain processes info -> makes sense of new input and links It w/ pre-existing long term memories -> "working memory"
    - Includes Auditory and visual rehearsal to form memories
    - Includes a central executive that focuses attention and pulls long term info to make sense of the new info
- 2nd new concept : not all memory is conscious -> long term memories can be formed through automatic processing w/out consciousness

Encoding Memories:

- A&S model -> focused on forming explicit memories/ declarative memories
- However -> there is a 2nd, unconscious track
- Effortful processing = explicit memory
- Automatic processing (goes directly to storage) = implicit/ non declarative memories
- Automatic processing and implicit memories
- Includes procedural memory for automatic skills & classically conditioned associations among stimuli

    - Space (remembering the location on a page), time (the ability to retrace your steps), frequency (how many times things happen)
- Effortful Processing and Explicit Memories
- Sensory memory:
    - Feeds active working memory
    - Spering conducted experiment with flashing letters and sounds -> people couldn't recall all 9 at the same time but could recall certain rows w/ near perfect accuracy -> demonstrated iconic memory -> momentary sensory memory of visual stimuli lasting no more than a few tenths of a second
    - Echoic memory: momentary sensory memory of auditory stimuli, last 3/4 seconds
- Capacity of Short term and Working memory
    - Miller: 7 bits (+- 2) pieces of info can be stored in short term memory -> Magical number 7
    - After 3 sec -> recall half, 12 sec -> barely any
    - Young adults have more working memory capacity
    - Working memory capacity appears to reflect intelligence level -> those whose minds can juggle multiple items while processing items (larger working memory capacity) retain more info after sleep and are more creative problem solvers, their mind wander less, can remember things despite being interrupted = high intelligence and higher focus
- Effortful processing strategies :
    - Chunking: organizing info into familiar/meaningful units = easier recall
    - Mnemonics: use vivid imagery to encode lengthy passages in ancient Greece, its easier to remember concrete visualize words than abstract ones
        - Uses the peg word system
        - Can be combined with chunking (acronyms)
    - Hierarchies : expertise allows you to understand by creating subdivisions
- Distributed Practice
    - Retain info better when encoding is distributed over time
    - Spacing effect: tendency to distribute study to yield better long term retention than is achieved through cramming
    - Massed practice = short term retention and confidence
    - Once you've mastered something, wait before returning to review
    - Testing effect: Roediger and Karpicke -> testing asses and improves learning, practicing retrieval
- Levels of Processing:
    - Verbal info is processed at diff levels + depth of processing affects long-term retention
        - Shallow processing = v basic encoding
        - Deep processing = semantic encoding based on meaning
        - The deeper the processing = better retention
- Making Material Personal
    - When info is relevant to you, it is easier to remember
    - Often we remember what we encoded rather than what the info is (you're notes v lecture)
    - Self reference effect: remembering what applies to you better than others

Storing & Retrieving Memories

November 26, 2017 2:02 PM

Memory Storage

- Capacity for storing long term memories is essentially limitless

• Retaining Info in the Brain

- Memories are brain based but they are distributed over a network of locations

- Explicit Memory System: Frontal Lobes and Hippocampus:
  - Process and store explicit memories
  - Facts = left lobe
  - Visual = right lobe
  - Hippocampus is the save button for explicit memories
  - Summoning up memories -> brain regions send input to frontal lobes for working memory processing
  - Hippocampus and networks are active as people form explicit memory
    - Diff part have diff functions: names & faces, spatial mnemonics, spatial memory (can grow)
    - Memories are not permanently stored here -> loading dock where brain registers and temporarily holds element -> eventually migrate for storage
  - Storage process = memory consolidation, begins after 3 hours
    - Sleep support memory consolidation -> during deep sleep, hippocampus processes memories for later retrieval -> cortex areas around hippocampus support the process
- Implicit Memory system: Cerebellum and Basal Ganglia
  - Cerebellum plays a key role in forming and storing implicit memories created by CC
    - If damaged ppl cannot develop conditioned reflexes
  - Basal ganglia -> deep brain structure involved in mvm, facilitates formation of procedural memories for skills
    - Receives input from the cortex but do not send info back to the cortex for conscious awareness of procedural learning
  - Implicit memory system helps explain why rxns and skills learned in infancy last in childhood, even though our conscious memory is blank of the first 3 years of life
    - Infantile amnesia: caused by:
      - The fact that explicit memory needs a lot of words to be indexed that toddlers haven't learned (don't know how to describe their experience)
      - Hippocampus is one of the last brain structure to mature (its too immature in toddlers)
- Amygdala, Emotions and Memory
  - Emotions trigger stress hormones
    - They make more glucose energy available to the brain -> signaling that something important is happening
  - Stress hormones focus memory
    - Provokes amygdala to initiate a memory trace in the frontal lobe and basal ganglia & to boost activity in the brains memory forming areas
      - Results in certain events being seared into the brain + disrupts memory for neutral events
  - Emotional events = tunnel vision memory -> only most relevant things are remembered
  - Flashbulb memories

• Synaptic Changes

- When learning occurs the tested sea slug (Aplysia) released more of the NT serotonin into certain neurons
- Synapses would become more efficient at transmitting signals
- Experience and learning can increase (even double) number of synapses

- Stimulating certain memory circuit connections increases sensitivity -> the sending neuron needs less prompting for releasing the NT and more connections have developed between neurons
- Increased efficiency of potential neural firing = long term potentiation (LTP_
    - Neural basis for learning/associations
    - 3 proofs that is the Phys basis:
        - Drugs that block LTP interfere with learning\mice w/out the enzyme needed for LTP couldn't learn their way out of a maze
        - Rats with enhanced LTP (drugs) learn the maze in half time
    - After LTP occurs -> passing an electric current doesn't disrupt old memories -> it wipes out new ones
        - Theory of electroconvulsive therapy given to depressed ppl
- Improving memory:
    - Drugs that enhance LTP NT glutamate
    - Drugs the boost production od CREB -> protein that enhances LTP
        - May also trigger increased production of other proteins that reshape synapses and transfer short term memories into long term memories

Memory retrieval

- Retrieval cues:
- Things that happened around the memory (context) that help you retrieve info
- Priming:
    - Association activated without awareness
    - Memoryless memory
- Context dependant memory
    - Remembering more when you are placed in the context in which you formed the memory
    - Experiencing something outside the =e usual setting can make it difficult to remember
        - Encoding specificity principle : idea that cues and context specific to a memory are most effective in helping us recall it
- State dependant memory:
    - Closely related to context related memory
    - What is learned in one state can be more easily remember in that state
    - Memories are somewhat mood congruent > tendency to recall memories that are consistent with ones good/bad mood
- Serial Position Effect:
    - Tendency to recall best the last and first items in a list:
        - At first you recall the last item especially quickly and well = recency effect (bc their still in working memory)
        - But after a delay-> their recall was best for the first = primacy effect

Forgetting, Memory Construction/Improvement

November 26, 2017 3:27 PM

Forgetting:

- Forgetting and the 2-track mind
- Henry Molaison- removed hippocampus -> couldn't form new memoires
- Anterograde amnesia: can recall the past, cannot remember the present
- Retrograde amnesia: forgot their past, can remember the present
    - They can be classically conditioned, learn procedural skills w/out any memory of having learnt it
- Encoding Failure:
- Encoding failure = not remembered
- With age, the brain areas that that encode info are less responsive in older adults
- Storage Decay:
- Course of forgetting is initially rapid and then levels off - also discovered by Ebbinghaus
- Retrieval failure:
- Forgetting isn't necessarily memories faded -> more so memories not retrieved
- Sometimes stem from interference:
    - Proactive interference : prior learning disrupts new learning
    - Retroactive interference: new learning disrupts old learning
        - Info presented one hour before bed is protected bc there is minimized opportunity for interfering events
    - Positive transfer: prior learned info can facilitate the learning of new info
- Motivated forgetting:
    - When info is still intact but not retrievable bc it is embarrassing
    - Freud would say that our memory self censors
        - Repress painful/unacceptable memories to protect ourselves
    - Increasing # of memory researchers thing repressed memory doesn't exist

Memory Construction Errors

- Every time you remember something it gets slightly edited -> reconsolidation
- The less you 'remember' something, the more accurate

- Misinformation and Imagination effects
- Exposure to misleading info leads to be ppl misremembering (although they seem confident) -> word choice, suggestiveness
- Imagination inflation: imagining something so much it seems true
- These two effects occur bc imaging something and actually perceiving it activate similar brain areas

- Source Amnesia:
- Attributing the wrong source to a memory (event, something we heard/imagined) -> also known as source misattribution, it (along with misinfo effect) are the heart of false memories
    - Demonstrated with an experiment with "Mr. science"
- Also explains "Deja Vue" -> caused by familiarity with a stimulus, without a clear idea of where weve encountered it -> when temporal lobe processing and hippocampus/frontal lobe processing are out of sink

- Discerning True and False Memories :
- We mostly remember the gist, than the actual event
- How we feel now, impacts how we felt before

- Children's eye witness recall: children are easily molded and suggested

- If questioned by a strange adult w/ non-leading questions -> can be v accurate

Improving Memory:

- Rehearse: use distributed practice, new memories are weak -> exercising them will strengthen them
- Meaningful: apply concepts to real life
- Activate retrieval cues: mentally recreate the situation and mood you were in
- Mnemonic devices: peg words
- Minimize interference: study before sleep and avoid conflicting topics
- Sleep more: the brain reorganizes info and consolidates it, take a break or lie down between study sessions
- Test knowledge

Basic Motivational Concepts

December 1, 2017 5:20 PM

Definition: need or desire that energizes and directs behaviour

- Comes from the interplay between nature (bodily push) and nurture (the pull from thought and culture)
- 4 perspectives for viewing motivated behaviours:
    - Instinct theory (has been replaced by evolutionary perspective): focuses on genetic predisposing behaviours
    - Drive-reduction theory: focuses on how we respond to inner pushes
    - Arousal theory: focuses on finding the right level of stimulation
    - Hierarchy of needs (Abraham Maslow): focuses on priority of some needs over others

Instincts and Evolutionary PSY:

- In early 20th century -> Charles Darwin's growing influence led to the classification of most behaviours as instinct
    - Problem became that instead of explaining behaviours -> instinct theorist were simply naming them -> naming doesn't equal explaining
    - To qualify as an instinct: behaviour must have a fixed pattern throughout species and be unlearned
    - Instinct theory -> fails to explain human motives but its underlying assumption continues in evol PSY

Drives and Incentives:

- When original Instinct theory collapsed -> replaced by drive-reduction theory
    - Idea that a physiological need (food/water) cerates an aroused state that drives organism to reduce the need -> Phys need increases = Phys drive increases
    - Phys aim of drive reduction = homeostasis (motivation behind DR theory)
    - We are pushed by need to reduce drive, pulled by incentive (positive or negative environ stimulus that motivates behaviour)
    - Incentives are impacted by individual learning histories -> what we find appetizing can motivate/inhibit you
    - Need + incentive = strong drive
        - Need = strong hunger
        - Incentive = baking pizza that smells good

Optimum Arousal :

- Some motivated behaviours increase arousal
- Well fed animals leave shelter to explore w/out any need based drive
- Sensation seekers -> risk takers who seek out high arousal -> intense music, food, behaviours, careers
    - Also motivated by dive to master emotion and actions
- Human motivation -> doesn't aim to eliminate arousal but to seek the optimal level
    - `when bio needs are satisfied we feel driven to experience stimulation -> when bored we look for a way to increase arousal to optimum levels
    - Too much = stress -> look for a way to decreases
- 2 early 20th century philosophers study relationship of arousal to performance and identified -> Yerkes Dodson Law
    - Principle tat performance increases w/ arousal only to a point, then performance will decreases
    - Moderate arousal = optimal performance -> varies by task
        - more difficult task = lower arousal for best performance

A hierarchy of motives:

- Base = physio needs -> only when met can we proceed to want to satisfy another need
- Safety -> stability, organized life
- Human need to give/receive love -> belong, accepted, avoid loneliness
- Self esteem needs -> achievement, competence, independence, respect
- Self actualization -> live up to OUR fullest potential
- Self transcendence needs -> proposed near end o Maslow's life -> strive for meaning, purpose beyond your own identity/self
- Not universally fixed -> culture should factor in, mates/parenting are argued to be human motives by evolutionary psych

Hunger

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- In a study on semi starvation -> after cutting food intake body weight eventually stabilized at 25% below starting weight
- Psycho effects where more dramatic:
    - Food obsessed
    - Lost interest in all activities
- Food/water seem necessary when your deprived, but non essential when your satisfied

Physiology of Hunger:

- Stomach contractions signal people to feel hungry
    - Experiment where a man swallows a balloon to simulate contractions
- Not the only source however -> rats w/out stomach still eat -> there are other indicators
- Body Chem and the Brain:
- Organism automatically regulate caloric intake to prevent energy deficits and maintain stable body weight
    - Suggests that somehow body keeps tabs on resources
    - One source: blood sugar glucose-> release/inhibition of insulin (secreted by pancreases)
        - Signals from stomach/ intestines/liver to brain regulate sugar release/uptake -> not felt by you
            - Processed by several neural areas -> hypothalamus : neural traffic intersection
            - Arcuate nucleus: has a center that secretes appetite stimulating hormone -> without it starving animals wont eat -> stimulating = well fed animals eat
            - Neural center of appetite supressing hormones: stimulated -> animals will stop eating -> w/out animals will constantly eat and become v fat
        - Blood vessels connect hypothalamus to body -> responds to blood chem and incoming info
            - One of its tasks : monitoring levels of appetite hormones -> ghrelin -> hunger arousing hormone secreted by empty stomach
                - During bypass surgery for severe obesity -> stomachs remove part of the stomach -> therefore less ghrelin therefore less eating
            - Leptin: protein hormone secreted by fat cells -> causes brain to increase metabolism and decrease hunger when abundant
            - Orexin: hunger triggering hormone secreted by hypothalamus
            - PYY: digestive tract hormone, suppresses appetite
- Set point: when body weigh falls below a certain level -> increased hunger and lowered metabolic rate work together to try and restore weight loss
    - Fat cells take glucose from blood stream -> hereditary influences body type and set point
- Bodies regulate weight through control of food intake, energy output and basal metabolic rate
    - Basal metabolic rate: body's resting rate of energy expenditure for maintaining basic functions
    - Drops to stabilize weight in extreme weight lose situation
- Counters against set point:
    - Slow sustained changes in body weight can alter set point
    - Psych factors can drive feelings of hunger
    - People will overeat if given access to v yummy food
    - For these reasons -> some abandon the fixed set point for the settling point
        - Indicates level at which a persons weight settles in response to caloric intake and expeditor -> influenced by environ and bio

Psychology of Hunger :

- Memory plays a part in knowing when we should eat -> amnesia patients will eat repeatedly

- Taste preferences: Bio and Culture
- Carbohydrates boost NT serotonin -> why we crave it when sad
- Preference for sweet/salty taste is genetic and universal
    - Some are conditioned -> people who always eat excessively salty food develop a liking
    - Sickened by food = aversion
- Culture: what is acceptable in one culture isn't in another (animal eyes, bugs)
    - Humans avoid unfamiliar food esp. animal based ones -> neophobia (dislike of unfamiliar things) -> was adaptive for ancestors to protect from possibly toxic substances
    - Repeatedly sampling = increased appreciation -> exposure to one novelty increases willingness for another
- Adaptive: spices mostly used in hot climates (where meat is at risk for spoiling) inhibit bacteria growth
    - Pregnancy nausea and food aversion peak @ 10 weeks bc baby is most vulnerable to toxins
- Situational Influences on Eating:
- Situations control eating = ecology of eating
    - Eating more when with others-> presence of others amplifies natural behaviour tendencies
    - Unit bias: size of portion/plate dictates how much people eat -> bigger pretzels, plates, scoops
    - Food variety: stimulates eating, buffet = more than portioned, variety was healthy for early ancestors -> eating more provided wide ranges of vitamins and minerals + produced fat

Obesity and Weight Control:

- Associated with lower psych wellbeing (esp. women) and depression
- Physiology of Obesity:
- Fat is ideal form of stored energy-> high calorie fuel reserve to carry body trough periods when food is scarce-> common occurrence in ancestors prehistoric world
- People in developing societies find heavier bodies attractive = affluence and social status
- No country has reduced obesity rate in 33 yrs.
- Proportion of overweight adult is increasing
- Variations of obesity are huge
- WHO= overweight = BMI of over 25
    - Obese = 30 or more
    - Fitness matters more than slight overweightness
        - Being overweight isnt a health risk -> obesity is
- Set point and Metabolism:
    - Challenges stereotype of obese people being weak willed and glutinous
    - Once you become over weight-> need less food to maintain our weight -> fat has lower metabolic rate than muscle -> therefore takes less energy to maintain
    - Trying to lose weight is hard bc the body has adjusted the set point and it will try and return to it by increasing hunger and decreasing metabolism
    - Lean people are more actually disposed to movement
- Genetic factor:
    - Weight resembles your biological parent
    - Twins have similar weights even when raised apart
- Food and Activity factors:
    - Sleep loss = obesity
        - Sleep loss = increases ghrelin and decreased leptin
    - Social influence: friends weights impact you
    - Fattening world = strongest evidence of environ impacting weight
        - Changing food consumption and activity levels
        - We eat more now and exercise less

Sexual Motivation

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- Not like hunger -> not a need
- Still motivates
- Sexual motivation = natures way of enabling survival through procreation

The Physiology of Sex:

- Hormones and Sexual Behaviour:
- Sex hormones are driving forces
- Male = testosterone (women have some too) -> stimulates male sex organ growth during fetal period and sex characteristics during puberty
- Female = estrogen -> estradiol (males have some too) -> female sex characteristics
    - Influence during: prenatal period (decide whether female or male), puberty (adolescence is triggered), after puberty/adult hood (sex)
- In most mammals -> sex hormones synchronize with fertility -> female animals are "in heat" when estrogen levels peak
- Male animal hormone levels are more constant
- Among women -> sexual desire rises slightly at ovulation (surge of estrogen and smaller surge testosterone)
    - Women have way less TT than men and are more impacted by it than other mammals-> if testosterone levels drops bc of ovary/adrenal gland removal -> sexual interest can decrease -> can be restored w/ hormone therapy
- In men w/ abnormally low TT levels -> hormone therapy is needed to restore libido, energy and vitality
    - Small fluctuations have little impacts
    - Can vary in response to stimuli
    - Sexual arousal can be a cause as well as result of increased TT
- Large hormonal surges/ declines happen at different points in life: 1& 2 predictable, 3 is un predictable
    - Puberty: surge of sex hormones triggers development of sex characteristics and interest -> if doesn't happen -> characterises/desire doesn't develop
    - Later life: estrogen levels fall and women experience menopause: sex hormones decline -> frequency of sex declines
    - Surgery/drugs can cause hormonal shifts: castration/ drugs can reduce TT levels
- Hormones are necessary but so are psychological stimuli

- Sexual Response Cycle:
- 4 stages: Masters & Johnson
    - Excitement: genitals become engorged with bloods -> clitoris and penis swell -> women's vagina expands and secretes lubricant -> breasts/nipples may enlarge
    - Plateau: excitement peaks (breathing, pulse and bp increase) -> penis becomes fully engorged (some fluid, containing enough live sperm to enable conception, secretes) -> vaginal secretion increases, clitoris retracts, orgasm is imminent
    - Orgasm: muscle contractions all over the body -> further increase in breathing, pulse and bp
        - Women arousal and orgasm facilitate conception: help propel semen from penis, position uterus to receive sperm, draw sperm inward (increases sperm retention)
        - Pleasure is v similar for both sexes
        - Same subcortical brain regions are active
    - Resolution: body returns to unaroused state gradually -> genital blood vessels release accumulated blood
        - Happens quicker if orgasm has been achieved
        - Men enter refractory period -> mins-day

        - Women have vv short period
- Sexual Dysfunction and Paraphilias:
- Sexual dysfunction: problem that consistently impairs sexual arousal/functioning
    - Sexual motivation (energy/arousability)
    - Erectile disorder: inability to develop/maintain erection due to insufficient blood flow to penis
    - Premature ejaculation
    - Women:
        - Pain
        - Female orgasmic disorder: distress over infrequently/never experiencing orgasm
        - Emotional relationship to partner
    - Therapy can help -> behavioral oriented therapy -> men control ejaculation and women train themselves to ejaculate
    - No drug like Viagra for women
    - Paraphilias: sexual arousal from fantasies, behaviours or urges involving non human objects, suffering, non consenting ppl
        - This behaviour is only disordered if a person experiences distress or entails harm/risk to others
        - Necrophilia: attraction to corpses
        - Exhibitionism: pleasure from exposing themselves sexually w/out consent
        - Pedophilia: attraction to pre-pubescent children
- STI:
- Teenage girls esp. vulnerable -> not fully mature biological development + lower levels of protective antibodies
- Condoms effective in protecting against: herpes, HIV,
    - AIDS is more often passed to women as men carry more of it in their sperm + it can linger for days in cervix
- High risk of HPV from oral sex -> can be prevented by vaccine

Psychology of Sex

- External stimuli
- Can become aroused from seeing/hearing or reading erotic material
- Sexual arousal can be pleasing or disturbing
- Repeated exposure lessen emotional response/habituates
- Adverse effects of viewing sexual content:
    - Rape acceptance: depictions of women being sexually coerced and liking increase viewers belief that women enjoy rape and increases men's willingness to hurt women
    - Devaluing partner: viewing women's of sexually attractive people lessens the value of your own partners appearance
    - Diminished satisfaction: x rated film reduce satisfaction with your own sex life -> unrealistic expectations form
- Imagined Stimuli:
- Brain is the most Signiant sex organ
- Imagination can influence arousal and desire
- People can still feel sexual desire even if they lack genital sensation (paralysis)
- Memories, fantasies (can produce orgasms in women)
- Men fantasize more often (gay or straight), more physically and less emotionally
    - Less personal and more fast paced sexual content
- Teen Pregnancy:
- Acceptability of teenage/unmarried varies
- American have higher teen pregnancy rates than Europe, but it is lower than the previous generations
- Genes influence teens sexual behaviour by influencing pubertal development levels and environments that stimulate sexual activity
- Factors that predict sexual restraint/activity
    - Minimal communication about BC: uncomfortable discussing with parents, teens w/

open parental relationships are more likely to use BC
    - Guilt related to sexual activity: sexual inhibitions/ambivalence can restrain sexual activity but also reduce BC planning
    - Alcohol use: most hook up are between intoxicated people (varying levels), less likely to use a condom, alcohol depresses judgement control, inhibition and self awareness
    - Mass media norms of unprotected promiscuity: lots of sexual content in media, TVs rarely show concern for BC, more sexual exposure = more likely to assume others are active, develop permissive attitudes, experience early intercourse
    - Later sexual activity = greater life satisfaction
    - High intelligence: higher scores = delayed sex -> appreciate neg consequences and are more focused on future achievement
    - Religious engagement : actively religious = sex in adulthood
    - Father presence: absence = early sexual activity, family closeness = delayed
    - Participation in service learning programs: volunteer work -> lower pregnancy rates -> unsure why

Sexual Orientation:

- Motivate is energize and direct behaviour:
    - Direction = sexual orientation
- Homo/hetero/bisexual
- Women are always more accepting than men -> number vary by culture

- Sexual Orientation : the numbers:
- 3 or 4 % of men and 2% of women (approx.) -> much smaller than assumed
- Psychologist view sexuality a neither willfully chosen or willfully changed (gay people cannot become straight and vice versa)
- More established for men -> women are more fluid
- Women have erotic plasticity: can be occasionally v active and the sometimes not, can be aroused by men and women
- Men: high sex drive is associated with increased attraction to one sex -> men usually only react to preferred sex
    - Women -> increased attraction to both -> women can react to both
- Sexual orientation is unrelated to pedophilia

- Origins o sexual orientation:
- Sexual orientation is something we do not change or choose
- Causes?
    - Assumed causes:
        - Problems with parents -> domineering mother/ineffectual father or possessive mother and hostile father
        - Fear/hatred of people of opp sex
        - Levels of sex hormones in blood
        - Childhood molestation/vicitmizati0on by an adult homosexual
        - ALL INCORRECT
    - Theory: segregation from opp during time of puberty -> homosexual behaviour has been exhibited in these communities -> however heterosexuality prevails
        - Homosexual behaviour does not equal homosexual orientation
    - Peer influence has little or no effect
    - Being raised by gay parents has no effect
    - If there are environmental factors that impact sexual orientation -> we do not know it
- Same Sex attraction in other species
    - Lack of environ. Explanations cause scientist to turn to brain differences. Genetics and prenatal influences in animals
    - Happens often in the animal world -> hundreds of species
- Gay straight Brain differences:
    - Experiments done by a gay scientist (LeVay) examined brains of deceased heter/homosexuals

    - Discovered that in gay people there was an enlarged center -> hypothalamus
    - Hypothalamus is not viewed as sexual orientation center- > an important part of neural pathway engaged in sexual behaviour
    - Sexual behaviour patterns may influence brain anatomy -> however he believes that that brain anatomy impacts orientation
        - Hormonal derived sexual scents -> when responding to the scent of their preferred gender -> the hypothalamus is activated
    - Anatomical difference happen very early post--Nataly -> possibly even prenatally

- Genetic Influence
    - Appears to run in families
    - Genes play substantial role in explaining individual diff in orientation
    - Genetic manipulations have created flies that act like the opp sex (homosexual)
    - Sexual orientation has been tied with two chromosomes -> one is maternal -> mlcls attached to gene impact expression -> by impacting sensitivity to testosterone -> creates feminine males/ masculine women
    - Theory for maintenance of gay genes despite inability to reproduce: kin selection -> genes live on through their families who can reproduce
    - Fertile females theory: maternal genetics are passed on. More homosexual relatives on the mother side,
- Prenatal Influences:
    - Elevated rates of homosexual orientation in twins indicates that prenatal environment can have an impact -> bc fraternal and identical twins share the same environment, but only one shares genes
    - Prenatal hormone conditions can impact fetus' orientation
    - Exposure to hormone levels of the opp sex-> disposes fetus to be attracted to same sex
        - (less TT for men, more TT for women)
    - Older brother phenomena / fraternal birth order effect : with each male pregnancy, the moms body develops more antibodies -> can prevent fetus from developing in a male typical patter -> more brothers = more chance of being gay
        - Doesn't happen in adoption or women

- Gay-Straight trait differences
- Gays and lesbians fall midway between straight females and males
- Lesbians cochlear system develops in a way that is intermediate to men and women
- Gay men are lighter at birth, lesbians are heavier

- Brain difference:
- On hypothalamic cell cluster us smaller in women and gay men than in straight men
- Gay men's hypothalamus react like a women's to sex scents
- Gay men's spatial abilities resemble women's
- Number of finger print ridges -> prenatal hormone impact

Sex and Human Values:

- Those who developed a commitment (like marriage) before sex -> more stability and better sex
    - Orgasms occur more often (esp. for women)
    - Less regret
- Gay and straight couples experience same impacts
- More satisfaction and prolactin hormone after intercourse/orgasm with a loved one than alone

Affiliation and Achievement

December 1, 2017 10:33 PM

The need to belong:

- According to Aristotle - humans are social animals
- Need to belong = affiliation -> basic human motivation
- Humans have an urge to community

- The benefits of belonging:
- Social bonds boosted our early ancestors chances of survival
    - Those who formed attachment were more likely to reproduce and co-nurture offspring to maturity
    - Attachment bonds motivated caregivers to keep children close/calm/protected
- Cooperation also enhanced survival -> solo combat was not effective -> learned that in hunting more is better
    - As food gatherers -> protected from predators by travelling in groups
    - Need to belong drives us to befriend people who cooperate and avoid those who exploit
- Happiest people were distinguished by their friendships not by money
- Peak moments of happiness often contribute to satisfaction/self-esteem/belonginess needs
    - When need for relatedness is satisfied in balance w/ the other two basic psycho needs ' autonomy (personal control) + competence -> experience sense of well being and self-esteem
- Form deep attachments and when parting we are distressed
    - Partial cause: feelings of love activate brain reward and safety systems
    - Pictures of our loved one activate a brain region associated with safety (prefrontal cortex) -> dampens feeling of physical pain
- Children in foster homes/system have difficulties forming attachment due to the disruption of other attachments
    - Become frightened, withdrawn and speechless
- Losing social connections attachments is distressing -> feelings of loneliness, anxiety, guilt
    - If our attachment is threatened = jealousy
    - Encouraged idea of chain migration -> families move one at a time into the same community -> transition becomes easier
- Social isolation = mental decline and ill health -> when feelings of acceptance/connection increase this is reversed
- The Pain of Being shut-out
- Ostracism : not speaking the language, being ignored, being excluded by word choice (his instead of their)
- Humans use forms of ostracism (exile, prison, solitary confinement) to punish & control social behaviour
- Feelings of loneliness spread quickly through a social network
- Response to ostracism: initially to try and restore acceptance, then depressed mood, then withdrawal
- Being ostracised stimulates the same brain center as physical pain ; anterior cingulate cortex
- Pain reliver acetaminophen soothes Phys and social pain -> around the world same words are used to describe emotional/Phys pain
- Pain focuses attention and motivates corrective action
    - When rejected people will turn to other sources of acceptance (new friends, religion etc.) or can become mean
- Connecting and Social networking
- Mobile networks and SNS
    - Less phone calls/emails -> speed talking in the form of texting/messaging
    - 3/4 teens texts, half send 60 or more texts daily -> friends are always seemingly present
    - 94% are on a SNS -> fear of missing out
- Net result:
    - Connecting like minded people -> internet is an amplifier -> info and support in

emergency
    - Online dating matchmaker
    - Are we more or les social isolated?
        - Originally online commun used to be w/ strangers -> therefore IRL relationships would suffer
        - Lonely people even now tend to spend more time online
        - People are less likely to know/ rely on neighbors
        - However -> SNS by connecting us w/ ppl around the world has mostly strengthened /diversified our connections
        - Period of SNS deprivation -> followed by a binge on social media
    - Does Electronic Commun stimulate healthy self-disclosure?
        - Self disclosure: sharing ourselves (joys/worries/weaknesses) with other
        - Confiding can b a healthy way of coping
            - Online communc means we are less self conscious, worried about other reactions, less inhibited
            - Can be taken to an extreme (bullying, nudes, bigotry online)
            - More often is deepens friendships
        - Nature designed us for face-face communic -> will always be a better predictor of life satisfaction
    - Do SNS profiles reflect acc personalities?
        - Generally they do
        - Do seem to reflect personality traits, likeability and true self rather than ideal
    - Does SNS promote narcissism
        - Narcissism: excessive self love and absorption, extreme of self esteem
        - Especially active on SNS
        - Collect more superficial friends, have more staged/glamourous photos, react more to neg comments, seem more narcissistic to strangers
        - SNS are a feeding ground for narcissists
- Maintaining Balance and Focus:
    - Excessive online presence = lower grades
    - To control online usage:
        - Monitor your time spent
        - Monitor your feelings
        - Hide distracting online friends
        - Turn of devices/leave them elsewhere
        - Try SNS fast or time controlled diet-> quit for an hour or only use after certain task has been accomplished
        - Refocus by taking a walk

Achievement Motivation:

- Biological perceptive is only one part -> there is a social component as well
- Some motives seem to have little survival value -> billionaires want more money, movie stars to become more famous, politicians to be more powerful
    - These motives don't diminish when fed -> we simply want to achieve more
- Persons drive to excel at any task that is marked -> achievement motivation -> desire for significant accomplishment/ mastery/ control and attaining high standards
    - Thanks to persistence and eagerness -> those with high achievement motivation achieve more
- Most people are energetic at the beginning and end of a project -> high achiever keep going in the middle (where most get stuck)
- Self discipline -> out does talent
    - Refines talent
    - Not enough alone -> discipline/time spent practicing is only 1/3 of the difference
        - Raw talent + discipline needed to make superstars
- Grit: passion and perseverance in pursuit of a long term goal

Intro to Emotion

December 2, 2017 12:11 PM

Emotion: Arousal, Behaviour & Cognition

- Emotions are a mix of:
  - Bodily arousal (heart pounding)
  - Expressive behaviour (quickened pace)
  - Conscious experience, including thought (kidnapping?) and feeling (panic, fear, joy)
- The puzzle -> figure out these 3 pieces fit together -> must answer 2 q:
  - Does bodily arousal come before or after emotional feelings
  - How do thinking (cognition) and feeling interact? Does cognition always come before emotion (did I think about kidnapping before reacting emotionally?)

• Historical Emotion theories:

- James Lange theory: Arousal comes before emotions:
  - First comes conscious awareness and then feeling
    - This theory is backwards
  - Argues that we feel things bc of your body's reaction -> we are scared bc we tremble, sad because we cry
  - Feelings of fear follow your body's immediate response of shaking, heart racing etc.
- Cannon-Bard Theory: Arousal and Emotion occur simultaneously
  - Body's responses are too similar and change too slowly to cause emotions -> heart racing is love or fear or anger?
  - Therefore bodily responses and emotional experiences occur separately but simultaneously
    - Heart begins pounding as you experience fear
  - Emotion triggering stimulus travelled to my sym nervous system causing body arousal ; at the same time, it travelled to my brains cortex causing awareness of the emotion
  - However -> if bodily response and emotions didn't affect each other then those w/ spinal cord injuries should report a difference in emotional reactions -> but they do
    - Those with lower leg paralysis report almost no change
    - However those with neck down paralysis do report differences -> emotions seem weaker -> not "heat in anger", however emotions that involve above neck reactions (crying, choking up) are felt more intensely
    - Bodily responses seem to feed emotions
  - Most researcher agree that cognition also plays a role -> how we interpret a man walking down the street determines if we feel threatened or not

• Schacter and Singer two-factor theory: Arousal and Label = emotion

- Emotional experience requires conscious interpretation of arousal -> our Phys reaction and our thoughts (perceptions, memories, interpretations) create emotions together
- Therefore to=wo factors: Phys arousal + cognitive appraisal
- Arousal can spill over from one activity to the next
  - Spill over effect
  - People can mimic other emotions if they are in an aroused state as well
    - Deepening on your interpterion of the situation the feeling that could be interpreted as fear can also become lust
  - Arousal fuels emotion -> cognition channels

• Zajenoc, Ledoux and Lazarus: does cognition always precede emotion

- We have many emotional rxns apart from/before interpreting a situation (like someone/something immediately w/out knowing why)
- When ppl view stimuli too shortly to process, subconsciously they still come to prefer it
- Emotional responses take 2 diff pathways
  - Complex emotions like love and hatred take a high road

        - Stimulus would travel by the thalamus to the brains cortex-> would then be analyzed & labelled before the response command is sent out via amygdala (emotional control center)
    - Simple emotions like dislikes, likes and fears take the low road
        - Neural shortcut that bypass the cortex -> travel from eye/ear vi thalamus directly to amygdala
            - This shortcut enabled our lightening emotional response (even before intellect interferes)
- Amygdala send more neural projections up to cortex than it receives back -> makes it easier for our feelings to hijack our thinking than for out thinking to rule feelings
- Much of emotional life operates via automatic speedy slow road
    - However an emotional rxns arises when we appraise a stimuli as good or bad (without acc knowing)
    - Such responses are difficult to alter by changing our thinking
- Thinking high road allows some control over feelings by allowing us to think positively, avoid generalizing and personalizing events

Embodied Emotion

- Emotions & ANS
- Sym division mobilizes body for action
    - Directs adrenal glands to release stress hormones
- Liver pours extra sugar into blood stream to provide energy
- Respiration increases to supply the needed oxy to burn the sugar
- HR & bp increase
- Digestion slows -> blood is diverted from internal organs to muscles
    - Becomes easier to run
- Pupils dilate to let more light in
- Perspiration cools you
- Blood will clot if faster in case of injury
- According to Yerkes-Dodson Law"
    - Arousal effect performance in diff ways
    - Depends on the task
- Physiology of Emotions
- Discerning between physiological differences of fear, anger and love -> v hard
    - Share common biological signatures
- Single brain region can also serve as multiple emotions
- Ex: Insula
    - Neural center deep in the brain
    - Activated when we experience neg social emotions -> lust, pride disgust
    - Becomes active when smelling/tasting/thinking about a gross food
- Emotions such as sexual arousal, fear anger feel different and look different
    - Fear and joy stimulate increased HR but diff facial mvm
- Emotions differ in brain circuits: fear = active amygdala, anger = less so
- Emotions activate different areas of the brains cortex
    - Negative emotions -> right prefrontal cortex more active
        - Depression/neg people = more right frontal lobe activity
    - Positive moods = left frontal lobe

Expressing Emotions

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Detecting Emotion in Others

- People may feel attraction if they stare at someone's eyes/hands -> even if they're strangers
- Good at reading non verbal clues
- Excel at detecting non verbal threats
    - Angry faces popup faster than happy ones

- Experience sensitizes us to certain emotions
    - Abused children spot signs of anger much quicker
- Its too difficult to perceive the difference between truths and lies
    - Differences in expression are too minute
- Some are better at detecting emotion -> introverts
    - Extroverts are easier to read
- Writing lacks many gestures/ expression/tone that Is needed for guessing emotion
- Egocentrism: failing to perceive how other may interpret your message
    - Common with SNS

Gender, Emotion and Non-verbal behaviour

- Women generally surpass men at reading peoples emotions
    - Emerges early in development (infancy)
- Women's non verbal sensitivity -> explains their greater emotional literacy
    - Women describe emotions more clearly/in complex ways
- Women's skill at decoding emotion -> contribute to greater emotional responsiveness
- Anger associated with men, happiness = women
- Women's emotion attributed to disposition, men's is to their circumstances
    - She's emotional v he's having a bad day
- Women are more likely to identify as empathetic and to express
- Women experience emotional events more deeply + w/ more brain activation
    - Better remember them after

Culture and Emotional Expression

- While gesture vary, facial expression are the same
- Explained by Charles Darwin's idea that in prehistoric times before language, our ancestors communicated in facial expressions-> shared expressions help them survive
    - Surprise opens eyes = take in info
    - Disgust wrinkles nose = limited scent ->enhances survival
- Western countries encourage emotion -> china doesn’t
- Emotion is best understood as a bio, cognitive and socio cultural phenomena

Effects of Facial Expressions

- Expression outwardly of emotions intensify them
    - Darwin's idea
- Doing the action of smiling/frowning can lead you to feel the emotion
- Facial feedback effect: tendency of facial muscle states to trigger corresponding feelings such as fear/anger
- Behaviour feedback effect: tendency of behaviour to influence our own/others thoughts, feelings and actions
    - Positive Facebook status, encourages others to post positive status

Experiencing Emotion

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- 10 basic emotions present in infancy -> joy, interest-excitement , surprise , sadness, anger, disgust, contempt, fear, shame, guilty
- Other believe that pride and love are also basic emotions
    - However some argue hat they are a combo
- Two dimensions of emotion:
    - Low v high arousal
    - Low v high valence (pleasant/unpleasant feeling)
- Every emotion is some combo of feeling good v bad and being aroused v not

Anger:

- Short madness that carries the mind away
- Fear trigger flight, anger triggers fight
- Chronic hostility linked to heart disease
- Anger triggers blood flow to our brains alarm system -> causing us to reflect on why are we angry
- People w/ sense of interdependence see their anger as a threat to group harmony
- Western anger venting culture presumes that we can achieve catharsis through it
    - Catharsis\; emotional release -> releasing aggressive energy relieves aggressive urges
    - Only true if: counterattack is director to provoker, retaliation seems justifiable , target is not intimidating
- Expressing anger can be temporarily calming if it doesn't make us guilty or anxious
    - Despite temp relief -> catharsis fails to cleanse rage
    - Expressing anger breeds more anger
    - May provoke further retaliation -> escalating
    - Acting angry makes us feel angrier (behaviour feedback)
    - Anger is dangerous as it prime prejudice
        - Also reinforce and cause us to form negative habits of outbursts
- Best way to manage ange4r:
    - Wait -> reduces arousal
    - Healthy distraction/support
    - Distance yourself: move away mentally
- Anger can: communicate strength, competence, motivate action and goals
    - Controlled expressions are more effective
- Civility: letting trivial issues go, talking over important ones
    - Non accusing statement "I…."
- Forgiving calms -> increases blood flow to regions that help ppl understand their own emotions

Happiness

- Feel good-do good phenomena : ppls tendency to be helpful when in a good mood
- Doing good also promotes good feeling
- Positive psych
- Humanistic psycho were interested in advancing human fulfilment
- Positive psych is using scientific methods to study human flourishing -> includes studies of subjective wellbeing
    - Self perceived happiness/satisfaction, used w/ measure of objective wellbeing (econ/health) to evaluate quality of life
- Researchers explore:
    - Positive emotions: assessing exercises and interventions aimed at increasing happiness

    - Positive health: studying how positive emotions enhance and sustain Phys wellbeing
    - Positive neuroscience: examine bio foundations of positive emotions, resilience and social behaviour
    - Positive education: evaluating educational efforts to increase students engagement, resilience, character, optimism, sense of meaning
- First pillar: positive wellbeing -> defined by satisfaction w/ past, happiness w/ present & optimism about future
- Second pillar: positive character: exploring and enhancing creativity, courage, compassion, integrity, self-control, leadership, wisdom, spirituality
- Third pillar: positive group/communities/cultures: seek to foster a positive social ecology -> includes healthy families, neighborhoods, effective schools, socially responsible media, civil dialogue
- Psych traditional interest: understanding and alleviating negative emotions

• Short life of emotional ups and downs :

- People often overestimate the duration of emotions and underestimate their resiliency and capacity to adapt
- Every bad mood ends eventually
- Best mood is midday and tapers off
- After a bad day, the next days mood seems even better than usual
- People who suffer tragedies usually regain near normal levels of happiness

• Wealth and wellbeing

- Those with more money = happier and better health
- Ppl in rich countries= better wellbeing
- Power of money to increase happiness is strong at low incomes and diminishes as income rises
- Economic growth in rich countries has provided no boost to morale/social well being
- Those who seek money to have power/sow off end up with lower well being
- Those who strive for intimacy, personal growth experience higher life quality

• Two psycho pheonomna : Adaptation and Comparison

- Happiness is Relative to Experiences:
    - Adaption level phenomena: tendency to form judgements (sound/light/income) relative to neutral level defined by prior experience
    - We adjust our neutral levels (point at which a sound is neither loud/quiet etc.) based on experience
    - We then notice/react to variations in these levels
    - Whether or not something satisfies us, upsets or has no impact depends on what we are used to
        - Eventually get accustomed to things that once made you v happy
- Happiness is relative to others success
    - Compare ourselves to other which determines how we feel
    - Relative deprivation: feeling worse-off in comparison to others
    - Satisfaction stems less from accomplishment and more from the rank
        - Making 50 000$ when everyone makes 25, is better than making 100 when everyone makes 200
        - A raise will make you happier if its greater than the raise everyone else got
    - Greater income inequality = more unhappiness

• What predicts Our happiness Levels

- Interplay between nature and nurture
- Genes matter -> diff among happiness rating is heritable
- Personal history and culture also matter -> emotions tend to balance around a level defined by experiences
- On cultural levels -> groups vary in traits valued
    - Self esteem and achievement + individualism = west
    - Social acceptance, harmony, family community = japan
- Depending on these factors our emotions fluctuate around our happiness set point-> why some are more upbeat

• Evidence based suggestion for a happier life:

- Realize that enduring happiness may not come from money

- Take control of your time
- Act happy
- Seek work/leisure that engage your skills
- Buy shared experiences instead of things
- Join the movement -> exercise
- Give your bod sleep
- Give priority to close relationships
- Focus beyond self -> care for others/kind deeds
- Count blessings + record gratitude -> keep track of good things
- Nurture your spiritual self -> faith

Stress & Illness

December 2, 2017 10:41 PM

Stress: Basic Concepts

- Stressor -> thing that causes stress
- Physical and emotional responses -> stress reaction
- Process by which one relates to the threat -> stress -> process of appraising and responding to a threatening /challenging event
- Stress arises less from the acc event -> more from how we appraise/perceive
- If short lived or perceived as challenge -> stressor can have positive effects -> mobilize immune system to fend off infection and heal wounds, motivates you to solve problems, when conquering a major stressor -> can lead to increased self-esteem and sense of purpose
- Extreme/prolonged stress is damaging
- Behavioural medicine research -> provides a reminder of contemporary psych overriding themes -> mind and body interact -> everything psycho is also physio

- Stressors:

- 3 main types: catastrophes, significant life changes, daily hassle -> all can be toxic
- Catastrophes:
  - Unpredictable, large scale events (earthquake)
  - For those who must relocate -> stress doubles -> trauma of uprooting, family separation, new culture, language, climate, social norms
    - In the first 6months (morale has not yet bounced back) -> many experience culture shock
- Significant Life Changes :
  - Marriage, Leaving home, divorce, job loss, death
  - Young adults are most stressed
  - Those undergoing life changes are more vulnerable to disease
- Daily Hassles:
  - Roommates, long lines, emails, to do list, annoyances
  - This type of prolonged stress takes toll on cardio system (bp levels)

- Stress Response System

- Medical interest ins tress dates back to Hippocrates
- Stress response is part of a unified mind-body system
- Extreme environment/stressors trigger the release of stress hormones (NE/NA) from the core of adrenal glands
- When alerted -> SNS arouses, prepares the body for fight or flight
  - Higher HR, respiration, diverts blood to SKM from GI tract, dulls pain, release sugar and fat
- Second stress response system has been identified: cerebral cortex via hypothalamus and PG, order the outer part of adrenal gland to release glucocorticoid stress hormones -> cortisol
- 2 systems have diff speeds-> NE is faster
- Body's adaptive response to stress is so general that anything can cause it to fire -> general adaptation syndrome (GAS)
  - Selye's concepts of the body's adaptive response to stress in 3 phases -> alarm, resistance, exhaustion
- GAS :
  - After suffering an emotional/Phys trauma:
  - Phase 1: alarm rxns -> SNS is activated -> fight is in effect
  - Phase 2: resistance -> temp, p, resp remain high -> adrenal glands pump hormones, fully engaged, summoning all resources -> as time passes, if no relief happens -> body resources start to dwindle
  - Phase 3: exhaustion -> become more vulnerable to illness, collapse, death

- Although the human body copes well with temp stress, long term stress can damage it
- Child stress-> brains production of new neurons slows and some neural circuits degenerate
- Severe stress can prematurely shorten telomeres -> why stress "ages people"
- Other ways to deal with stress;
    - Withdraw, pull back, conserve energy, paralyzed by fear
    - Give and seek support (often women) -> tend and befriend response -> people provide support to other and seek their support by bonding -> outpouring of help after natural disasters
        - May be partially due to oxytocin -> for women, brain areas assoicated with empathy become more active, men less
    - Men -> more likely to become aggressive, alcoholics , withdrawn

Stress and Vulnerability to Disease

- Behavioural medicine: study how stress, healthy, unhealthy behaviours influence health and illness
    - Health psychology -> psychology's contribution to behavioural medicine
- Psychoneuroimmunology: study of how psycho, neural and endocrine processes affect immune system and health
- Immune system: when functioning properly -> isolates and destroys bacteria, viruses, invaders
- Four types of cells in immune system
    - B lymphocytes: WBC, mature in bone marrow and release antibodies that fight bacterial infections
    - T lymphocytes: WBC, mature in thymus, attack cancer cells, viruses and foreign substances
    - Macrophage (big eater): identify, pursue and ingest harmful invaders and worn out cells
    - Natural killer cells: pursue diseased cells (infected by virus/cancer)
- Age, nutrition, genetics, bod temp and stress influence immune system
- If not function properly:
    - It will respond too strongly: attack your own tissue, allergic reactions or self attacking disease (lupus, multiple sclerosis, arthritis), women are immunologically stronger therefore more vulnerable to self-attacking diseases
    - Underreactions: immune system may allow bacterial infections to flare up, dormant viruses to erupt, cancer cells to multiply-> to protect transplanted organs (foreign body) surgeons deliberately suppress immune system
- Stress can also supress immunity by reducing release of disease fighting lymphocytes
    - Surgical wounds heal slower in stressed people
    - Stressed people are more vulnerable to colds -> major life stress increases risk of respiratory infection
    - Low stress can increase effectiveness of vaccinations
- Stress is competing energy need -> body cannot fully fight off infections bc it cannot maintain a fever, track down invaders, reduce muscular energy output and increase sleep -> during stress energy is taken from immune system and rerouted to muscles and brain
- Stress doesn’t make us sick -> reduces our ability to fight off infection

- Stress and AIDS:

- Immune disorder
- Caused by human immunodeficiency virus
- 6th leading cause of death in world, #1 in Africa
- If a disease is spread through human contact and kills slowly ->it is lethal to more people
    - Those who have HIV spread around as they are highly contagious in the first few weeks -> without even knowing they're sick yet
- AIDS appears year after the initial infection -> difficulties fighting off disease
- Stress and negative emotions speed transition from HIV to aids
- Stress predicts faster decline in those with AIDS
- Efforts to reduce stress would help control disease
- AIDS is far more treatable-> best option would be preventing HIV infection
    - Combination prevention program: medical strategies + efforts to reduce social

inequalities that increase HIV risk

- Stress and Cancer
- Those who are stressed + exposed to carcinogens are more likely to develop tumors bc immune system has been compromised due to stress
    - However this is not 100% proven in humans (mixed results)

- Stress and Heart Disease:
- Coronary heart disease: clogging of vessels that nourish hart muscle, leading cause od death in developed countries
- Stress and personality playa role
    - More psych trauma = more inflammation of the body -> associated with heart problems
- Type A Personality
    - Reactive, competitive, driven, impatient, time conscious, supermotivated, aggressive and easily angered
    - Easy going = type B
    - In an experiment involving the two groups -> not a single type B has a hear attack -> 69% of those who had heart attacks where type A
    - Problem with type A -> toxic negative emotions-> anger and aggression
    - When we are angered -> body pulls blood from internal organs and redistributes it to muscles -> pulls blood away from liver, reducing its ability to remove cholesterol and fat from blood
        - Type A are more often "combat read" therefore excess cholesterol and blood circulate in their blood longer, depositing around heart
        - Further stress may trigger heart rhythms
- Type D personality:
    - Those who supress their negative emotions to avoid social disapproval
    - Negative emotion -> distress
    - Ha higher risk of mortality and non fatal heart attacks
- Effects of Pessimism and Depression:
    - Pessimists 2x likely to develop heart disease
    - Depression increase risk of heart disease
- Stress and Inflammation:
    - Work pressures cause increased risk of heart attack
    - Heart disease and depression can result when chronic stress triggers constant inflammation
    - After one heart attack, the stress and anxiety may increase the risk of a second
    - Stress disrupts immune system and enhance one immune response -> production of proteins that contribute to inflammation
        - Inflammation usually fights infection however if persistent it can produce asthma, clogged arteries and increase depression

Health & Coping

December 3, 2017 12:48 PM

Coping with Stress

- Coping: alleviating stress using emotional cognitive or behavioral methods
- Problem focused coping: attempting to alleviate stress directly -> by changing the stressor or the way we interact with that stressor
    - Going directly to a family member to resolve the fight
    - Used when we feel a sense of control over a situation and think we can change the circumstances
- Emotion focused coping: attempting to alleviate stress by avoiding or ignoring a stressor and attending to the emotional needs related to our stress rxns
    - When we believe we cannot change a situation
    - Reaching out for support
- Feelings of personal control, explanatory style and support influence how we cope

- Personal Control:
- Uncontrollable threats trigger the strongest stress response
- Series of uncontrollable events creates a state of learned helplessness:
    - Hopelessness and passive resignation an animal/human learns when unable to avoid repeated aversive events
    - After a series of uncontrolled events, even when there is an event one can control -> we cant bc we've learned to be helpless
- Perceived loss of control = vulnerability to sickness
- More control a worker has = longer they live
- Highest economic status = lower risk of heart/resp disease + longer life + better health among children
    - Reduced risks of low birth weight, infant mortality, smoking, violence
- Losing control produces an outpouring of stress hormones -> bp rises, immunity lowers
- Increasing control improves health and morale -> allowing prisoners to move furniture, control tv, workers to participate in decisions, personalising work space
- Western culture offers excessive freedom -> too many choices -> decreased life satisfaction, increased depression, behaviour paralysis,
    - Tyranny of choice: information overload and greater likelihood that we will feel regret over some of the things we left behind
- Internal vs External Locus of Control
    - External locus of control: perception that chance/outside forces beyond our control determine our fate
    - Internal locus of control: the perception that we control our fate
    - "internals" achieve more in school/work, were more independent, had better health, less depressed
        - Less obesity, lower bp, less distress
    - Those who believe in free will -> learn better, perform better, more helpful, punish rule breakers,
    - Young Americans are more external
- Depleting and Strengthening Self Control
    - Self control: ability to control impulses and delay short term gratification for greater long term rewards
    - Predicts good health, higher income, better grades
    - Weakens after use, strengthens after rest and grows stronger with exercise-> exercising will power temp diminishes it for other tasks
    - Exercising will power diminishes neural activation associated with areas of mental control -> sugar strengthens self control -> simply rinsing mouth with sugar water will do it

- Short term effect of self control -> weakened, long term effect -> strengthened

- Explanatory Style: Optimism v Pessimism
- Expecting things to go badly -> attribute poor performance to lack of ability or situations beyond their control,
- Optimists expect to have more control, cope better with stressful events, enjoy better health, smaller increases in bp, better immunity, recover faster from surgery
    - Get better grades as they respond to setbacks w/ hopeful attitude that effort, studying and discipline will make a difference
    - In relationships: engage constructively, feel supported and satisfied
    - Fuel motivation and success
    - Runs in families -> genetic marker is oxytocin -> enhances social bonding
- Everyone can learn to be more optimistic

- Social Support
- Feeling liked and encouraged by family/friends -> happiness and health
- More social connections = longer life
- Need to belong is so high that ppl may risk their life to attain
- Social support calms us and reduces bp and stress hormones
    - Having loved ones help you face stress with less activity in threat responsive areas (holding your husbands hands instead of a stranger)
- Social support fosters stronger immune function -> those with most social ties are least likely to get sick regardless of age, sex, race etc.
    - If they do get sick -> they produce less mucus
- Close relationships given an opportunity for open heart therapy -> chance to confide painful feelings
    - Talking about a stressful event momentarily arouses us but clams us in the long term -> calms limbic system activity
    - Suppressing trauma leads to poorer health
        - Even writing in a diary is helpful

Reducing Stress
- Sometimes we cannot alleviate stress -> we can only manage it
    - Aerobic exercise, relaxation, meditation, spirituality

- Aerobic Exercise:
- Sustained, oxygen consuming exercise -> increases heart and lung exercise (jog, swim, bike)
- Moderate exercise adds quantity and quality to life -> more energy and better moods
- Helps fight heart disease by strengthening it, increasing blood flow, keeping blood vessels open, lowering bp and bp in times of stress
- Genes from ancestors enable these activates -> needed for hunting/foraging/farming
    - In muscle cells -> when these genes are activated by exercise, they produce proteins
    - In the modern inactive person, these genes produce less protein -> leaving us vulnerable to chronic diseases (diabetes, heart disease, stroke, cancer)
- Those who exercise more: manage stress better, self confident, vigorous, less depressed/fatigued
- Phys exercise is a strong indicator of life satisfaction
- Exercise diminishes depression levels as effectively as anti depressants and w/ longer lasting effects
    - Even a 10 min walk cause 2 hours of well being
- Exercise acts in a similar way to antidepressants -> increases arousal (counteracting depressions low arousal state), leads to muscle relaxation, sounder sleep, releases NE and serotonin + endorphins, may foster neurogenesis
- Sense of accomplishment and improved physique/body image can enhance self image and lead to better moods

- Relaxation and Meditation:
- Biofeedback: system of recording, amplifying and feeding back info about subtle physio responses controlled by ANS
    - Was eventually discredited
- Simple methods of relaxation, produce the results that biofeedback promised
- Can reduce depression, hypertension, headaches, anxiety, insomnia
- In an experiment to help type A heart attack survivor -> relaxation techniques helped them avoid heart attacks as those who didn't had twice as many
    - Relaxed by walking, talking, eating more slowly, smile, laugh at themselves, admit mistakes, enjoy life, renew religion
    - Relaxation help surgery patients recover faster and have less stress
- Mindfulness mediation: relax and silently attend to inner state w/out judgement, closing eyes, scanning body, remain aware and accepting, pay attention to breathing
    - Improves immune system, sleep, binge eating, smoking, decision making -> 3 explanations:
        - It strengthens connections among brain regions: affected regions are those associated with focusing our attention, processing sensory info and being reflective and aware
        - Activates brain regions associated w/ more reflective awareness: when labelling emotions, mindful people show less activation in amygdala (fear) and more activation in prefrontal cortex (emotion regulation)
        - Calms brain activity in emotional situations: lower activation means little change in brain response to sad v neutral, emotionally unpleasant images trigger weaker electrical brain responses in mindful people than others
- Massage therapy can also relax premature babies and those in pain -> relaxes muscles and reduces depression

- Faith Communities and Health
- Faith factor: religiously active people tend to live longer than those not
- Religious involvement doesn't simply reflect the fact that women (who are more religious) live linger than men
- Not necessarily proven to be a cause -> predictor of health and longevity
- 3 possible explanations:
    - Healthy behaviours: religion promotes self control, religious ppl drink/smoke less and live healthier
        - Lifestyle differences aren't enough to explain the dramatic difference
    - Social support: faith is a communal experience, ppl are there for each other in times of misfortune, encourage marriage (predictor of health and longevity)
    - Positive emotions: people may benefit from a stable, coherent world view, sense of hope for the future, feelings of acceptance, relaxation effects of prayer -> maybe why religious ppl have better immune functions, less hospital visits and for AIDS patients (less stress hormones and more survival)