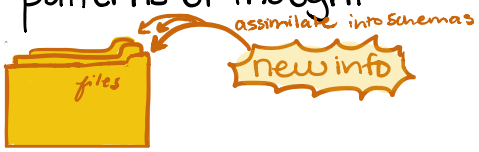
Attention

Selective attention:	Focusing on one aspect of the environment while ignoring others.
Cocktail party effect:	Not paying attention until you hear a specific cue and you shift your attention
controlled processing:	Requires focused awareness
divided attention:	Split attention between multiple tasks.
automatic processing:	Natural processing without cognitive awarness of the situation.

Information Processing Theory

- Thinking: Perception of stimuli, encoding stimuli, storage for later.
- Analysis of Stimuli: Stimuli are altered and analyzed by the brain
- Situation Modification: Stored decision making from the past can be extrapolated to solve new problems.
- Obstacle Evaluation: Nature + context of an obstacle > an individuals cognitive development

Schemma: patterns of thought



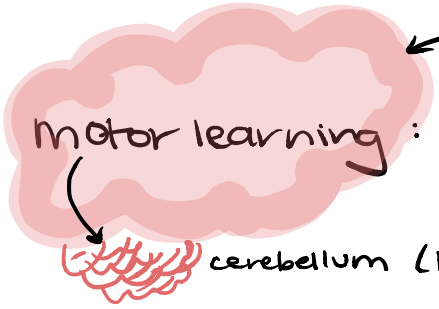
Piaget's Stages of Cognitive Development

0-2 1) Sensorimotor: Object permanence, language development, sensory curiousity.

2-7 2) Preoperational: Symbolic thinking, use of proper syntax + grammar.

7-11 3) Concrete operational: Concepts + concrete situations, time + space + quantity understood.

11+ 4) Formal operational: Abstract logic + thinking + strategy and planning become possible.



Semantic memory = stable memory.

Procedural memory = stable

Overall memory = Declines

Working memory = Declines

"Other" influences on cognitive development

→ Culture: different values + traditions

→ Heredity: Down's Syndrome, Autism, etc.

→ Environment: Chemical toxins, fetal environment (FAS)

→ Biology: metabolic/biological conditions

Problem Solving [Decision Making]

Mental Set: "Set in your ways" for approaching a problem
- rigid thinking
- lack of cognitive flexibility.

ie: how I study

Functional Fixedness: a mental set where we can only visualize an object or tool how we've seen it used.

ie: looking for a screw driver when a knife would work. Not realizing that a rubberband could tie up your hair.

Cognitive Bias.

APPROACHING PROBLEMS

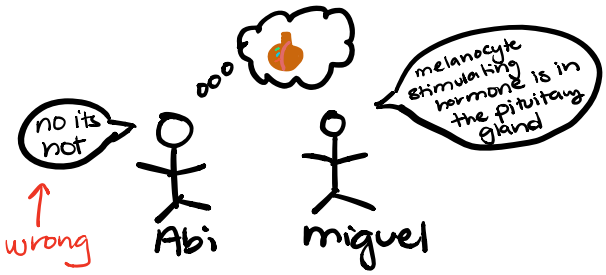
① Trial + Error: Test and determine

② Algorithms: mathmatical formulas

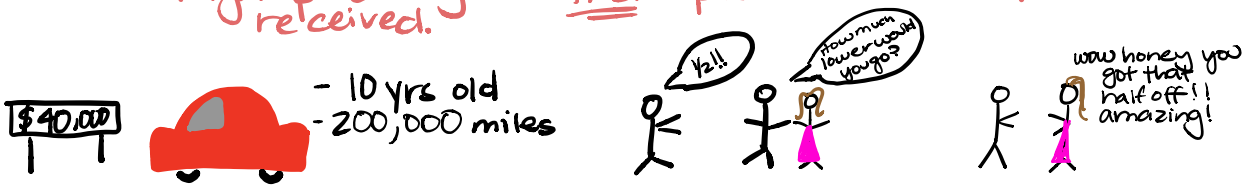
③ Heuristic *KNOW THESE WELL

↳ Representative Heuristic: prototypes/stereotypes as a short cut to a decision.

↳ Availability Heuristic: Favoring most easily recalled solution to make a decision



↳ Anchoring and adjustment Heuristic: Giving high priority first piece of information received.



④ Intuition
"Gut feeling" (mental set)

⑤ Deductive Reasoning: conclusions based on assumed premises
"Top-down" reasoning

"The sun has come up every day and will come up tomorrow also."

⑥ Inductive Reasoning: making generalizations from specific observations.

: "All older people are republicans because my grandparents are old and republican."

Biases

confirmation bias: Ignoring facts that don't support your preconcieved notions

overconfidence: convinced we've arrived at the right decision even when we're wrong.

belief perseverance: faced with evidence that CLEARLY contradicts our biases but we still hold onto them.

base rate fallacy: When representative heuristics used in error.

MCAT Q:

Sample MCAT Question

- Altius text book

1) Suppose it is discovered that the kidney has a hormone function that was previously unknown and is currently the subject of further investigation. A researcher exhibiting functional fixedness is likely to favor which new kidney function?

A) Secretion of gonadotropins
B) Secretion of oxytocin
C) Regulation of aldosterone levels
D) Regulation of triiodothyronine levels

Solution: The functional fixedness bias suggests that a person has a hard time visualizing a tool or object as having a use or application different from the one with which they are accustomed. Applied to kidney function, researchers would be biased toward a new kidney function that is closely related to what they normally expect the kidney to do. Answer C is therefore correct, because it involves a hormone that acts on the kidney. Answers A, B and D are false because these hormones are unrelated to the kidney (based on current understanding) and therefore researches would have a hard time considering them in an unbiased way as possible new functions.

*This is a great example of an MCAT question applying different subjects. This could easily be asked on the Psych Section.

Intelligence Theories

① Gardner's Theory of Multiple Intelligences

1) Visual Spacial → forming accurate visual images, mentally rotating objects in 3D space.
2) Bodily Kinesthetic → using body in a skilled way: dance
3) Musical → musical competance: tone, rhythm, pitch
4) Interpersonal → read other people's moods + act as such
5) Intrapersonal → understand ones own feelings
6) Naturalistic → recognize + characterize natural objects
7) Linguistic → Language + words
8) Logical-Mathmatical → logical steps to solve a problem

- Q: what two intelligences can IQ measure? •

  Linguistic and Logical

② Galton

- nature not nurture
- genetics determine intelligence "genetic intelligence"
- concept of correlation

eugenetics

↓

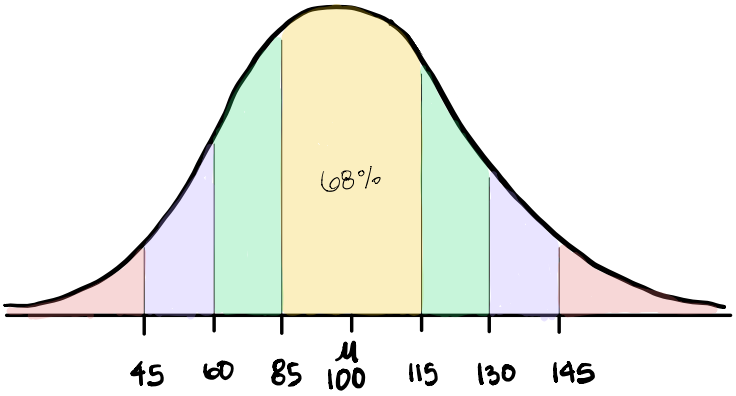
eliminate undesireable genes → abort Down's Babys
→ abort diseased babies
→ now considered unethical

③ Spearman

- General intelligence "g" → creates all other forms of intelligence.

④ **Binet**

- Binet-Simon intelligence scale
  - Mental Age
  - Chronological Age
  - → Stanford Binet IQ test



$\delta = 15$

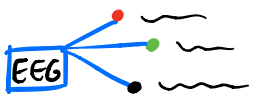
- Linguistics
- Logical-mathmatical

$$IQ = \frac{\text{mental age}}{\text{chronological age}} * 100$$

+ correlations

↑IQ | ↑ Parental expectation | ↑ SES | ↑ Early education intervention | ↑adequate nutrition

Conciousness

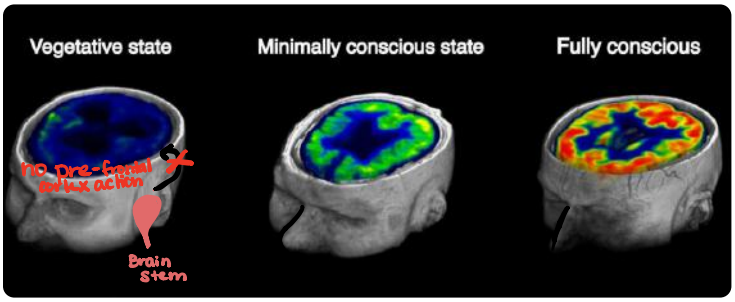


Alert → Sleep → Dreaming → Hypnosis → Meditation → Drug-Altered

- β Beta: awake + alert
- α alpha: very relaxed / meditating
- θ theta: light sleep
- Δ delta: deep sleep

↓ λ decreasing

Coma: loss of reticular formation of the brain stem to stimulate the prefrontal cortex to maintain alertness



Sleep: 24 hour intervals
& Circadian Rhythms &

↑ cortisol when awake

Stage 1 = Falling asleep (α, θ)

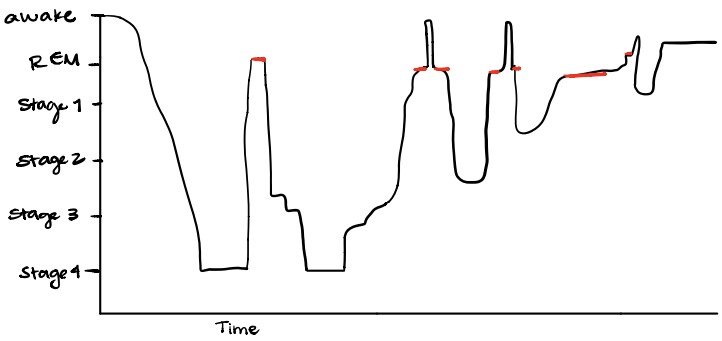
Stage 2 = Deeper sleep (θ)

Stage 3 = Transitional (θ, Δ)

Stage 4 = Deep sleep (Δ slow waves)

REM → Rapid Eye Movement
- → Vivid dreams
- → paradoxial sleep = irony of REM
  - alertness
  - heart rate
  - breathing
  - EEG seems wakeful

BUT muscles are paralyzed

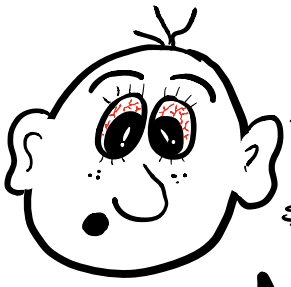


Chronic Sleep Deprivation

↑ depression

↓ cognitive functioning

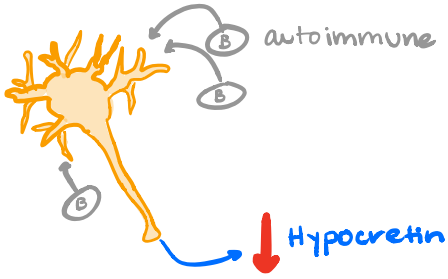
↑ Chronic disease
↑ heart disease
↑ obesity
↑ diabetes



insomnia: difficulty sleeping

sleep apnea: difficulty breathing while asleep

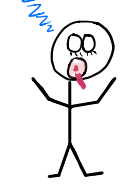
Narcolepsy



↑ Fatigue
↑ Cataplexy
↑ daytime sleep

Parasomnia

Sleep walking — somnabulism



Night terrors - pavor nocturnus
└ stages 3-4

↑ sympathetic NS.

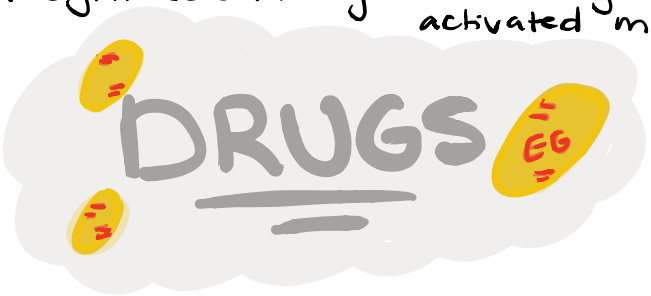
Psychoanalytical Theory = unconcious desires

Cognitive Theory = Conceptualization of our experiences

Information Processing Theory = memories consolidated during sleep (cerebral cortex)

Problem solving Theory = Dreams solve problems that are encountered while awake. (sleep = unrestricted by reality)

Activation-Synthesis Theory = limbic system is randomly activated mimicking stimuli.



① Depressants → alcohol, barbiturates, benzodiazepines

- barbiturates → CNS depressent → sleep-inducing → ↓ BP, ↓ HR → ex: amobarbital
- benzodiazepines → ↑ GABA → sedative, hypnotic sleep → ↑ muscle relaxation → ex: Xanax, Valium

② Stimulants → Amphetamines, cocaine, ecstasy

- Amphetamines → ↑ CNS (stimulant) → ↑ Dopamine → slower onset/longer acting → treats: ADD, narcolepsy
- cocaine → ↑ CNS (stimulant) → ↑ Dopamine → ↑ HR, ↑ BP → ↓ O_2 supply → ↓ Na transport → treats: local anesthetic
- ecstasy → ↑ serotonin, dopamin, norepinephrine → ↓ reuptake of neurotransmitters → ↑ body temp → psychadelic effects → treats: PTSD

③ Halucinagens → LSD (lysergenic acid diethylamide), mushrooms

LSD:
↑ Seratonin + dopamine
↓
hallucinations
↓
mood altering
↓
↑ HR
↑ BP
↓
↓ appetite
↓
panic attacks/anxiety

mushrooms:
psilocybin
↓
↑ Seratonin receptor
↓
CNS ↑ Sympathetic NS
↓
euphoria
↓
↑ HR
↑ BP

④ Pain Killers → Opiates, Opioids

Opiates:
↑ brain, spinal, GI receptor binding
↓
↓ CNS
↓
↓ Pain
↓
euphoria/drowsiness
↓
↓ HR
↓
ex:
codeine
morphine
Heroin

Opioids:
↓
Oxycodone + hydrocodone

⑤ Marijuana → Stimulant, depressant, hallicinogen

alcohol → ↑ GABA → ↑ Cl^-

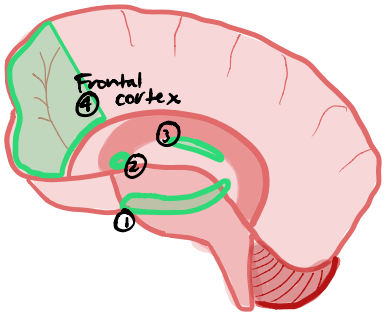
a) voltage = increased membrane potential. inside cell = very negative.

b) neuron will require more stimulus to reach threshold

Drug addiction

↓

dopamine reward pathway in limbic system



① mesolimbic dopamine pathway originating in ventral tegmental area. (VTA)
[Midbrain]

Language development theories

- Learning – environmental, behaviorist, nurture
- Nativist – biological or nature
- Interactionist – social interaction between child + adult

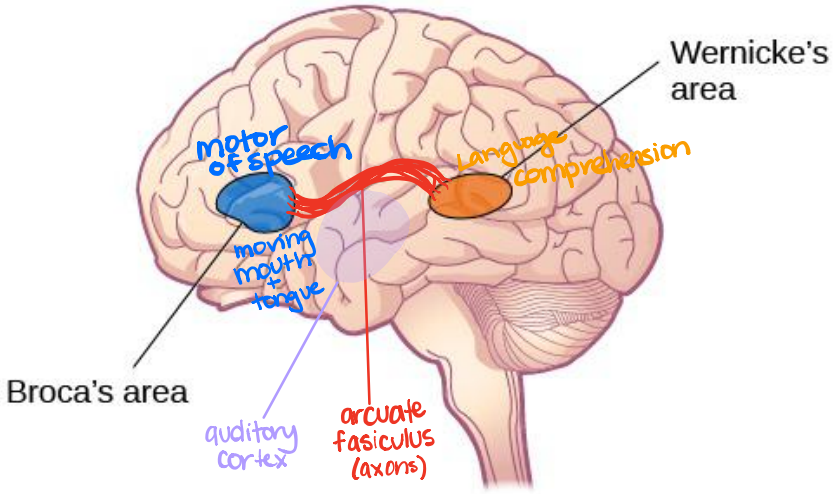
Pragmatics: ability to competantly use language in social context

Semantics: meaning of language + meaning change

Syntax: rules of grammar (sentance rules

morphology: how words are formed from sounds

phonology: sound units in a language



Emotion

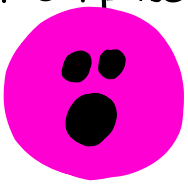
Components

- **Subjective Experience** (Cognitive Response) = subjective interpretation of mood or feelings experienced.
- **Physiological Response** = physiological changes: heart rate, BP, breathing, skin temp.
- **Behavioral Response** = Facial expressions or body language from emotion.

7 Universal Emotions

+ Happiness

+ Surprise

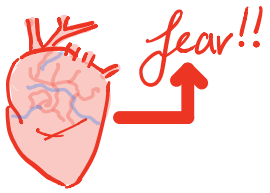


The adaptive role of emotion

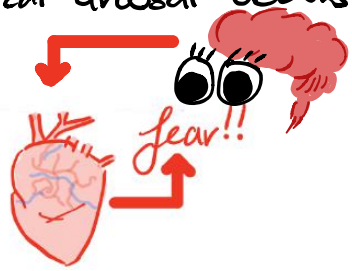
↳ Darwin suggested emotion evolved due to natural selection, similarly to other traits.

THEORIES OF EMOTION

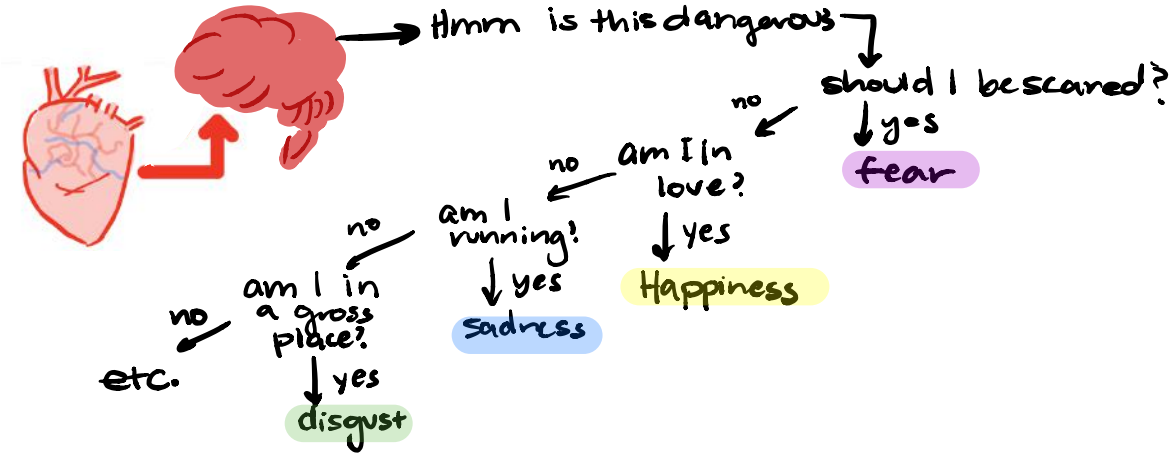
- James-Lange → James Bond only has emotions cuz of his biology.
  ↳ Emotions arise from physiological arousal
  Aka Sympathetic Nervous system controls what we feel



- Cannon – Bard → Cannons shoot, we feel emotions and have a physiological response
  - Physiological arousal occurs simultaneously with emotion!



- Schachter – Sanger → Singers compensate for their physiology by using cognition
  - Emotions
    - physiological
    - cognitive



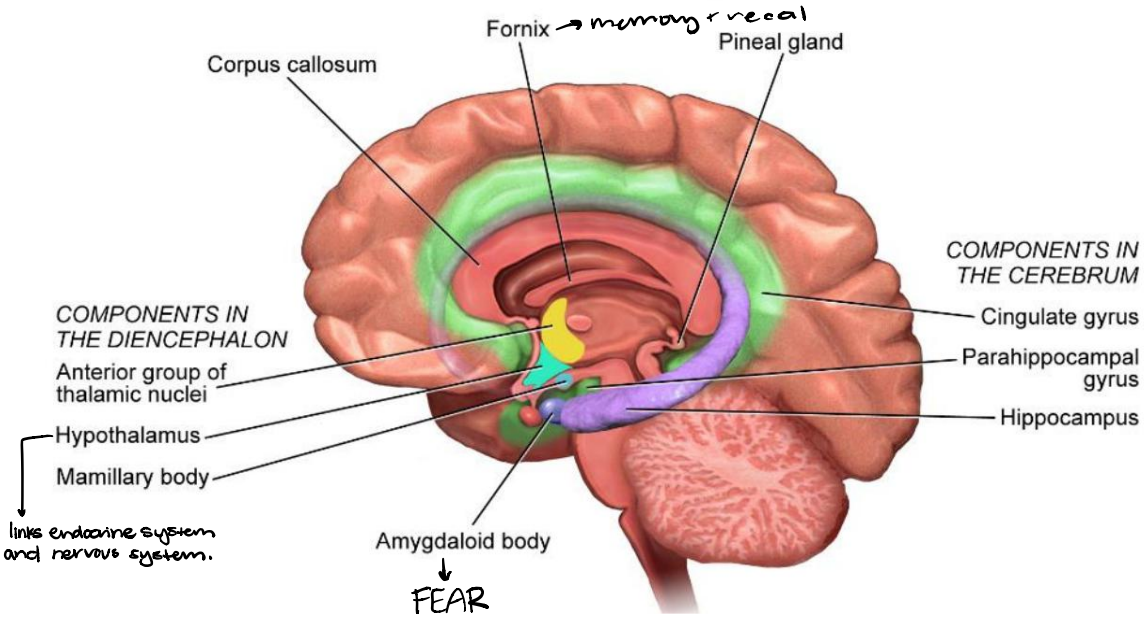
The Limbic System: Emotional Brain

+

Ventral prefrontal cortex

- left → positive emotions
- right → negative emotions

The Limbic System



↳ Physiological Manifestations

Skin Temp: ↑ during anger ↓ during fear

Conductivity (skin): ↑ during ↑ Sympathetic Nervous System

Heart Rate: ↑ during anger + fear ↓ during happiness

Blood Pressure: ↑ during anger, fear, saddness, and happiness

~Stress~

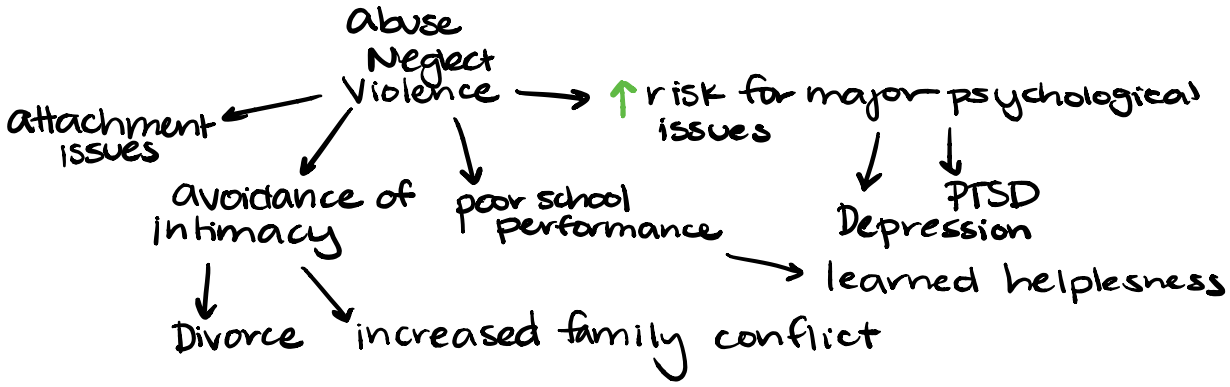
Appraisal

Primary appraisal → initial evaluation of the threat

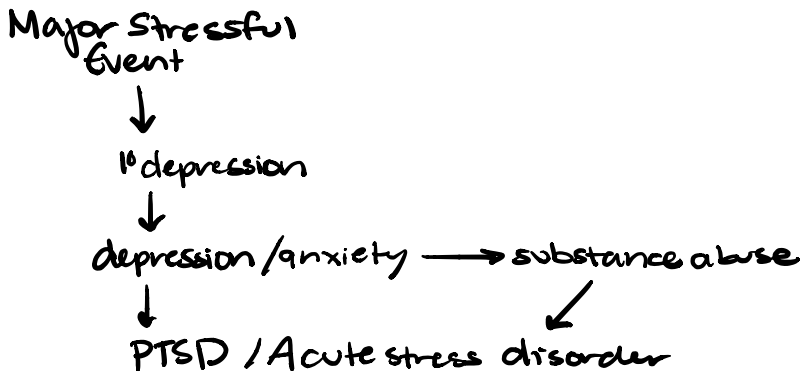
- Irrelevant (unimportant)
- benign positive (good)
- Stressful (bad) → Secondary appraisal → do I have the resources to deal with this threat

- Eustress → Positive Stress
  - Graduating
  - marriage
  - new job
- Distress → Negative Stress
  - divorce
  - bad grades
  - losing job

Childhood stressors:



adult stressors



General Adaptation Syndrome

Response to stress

① alarm stage → dilated pupils, ↑ BP, ↑ HR, ↓ blood to digestive organs, ↑ glucose production, ↓ peristalsis

② resistance stage

③ exhaustion stage

Managing Stress

- **Problem-Solving approach**: Find solutions, obtain help, create prevention plan
- **Emotional Approach**: Positive thinking, taking personal responsibility, internal locus of control

Theories of Motivation

- Instict theory

  Behavior is based on evolutionary insticts

- Arousal Theory

  Behavior is done to maintain optimal physiological arousal

  ↑arousal = relaxing activities
  ↓arousal = new interests/action/stimuli

- Drive-Reduction Theory

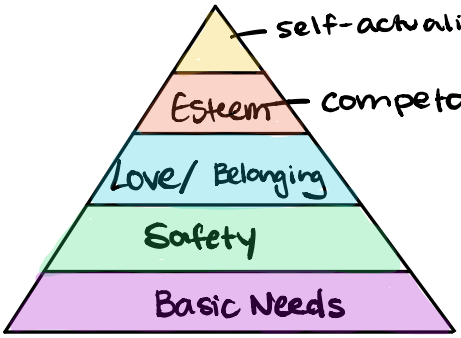
  Behavior is done to reduce/eliminate an uncomfortable internal state

  1° drive = biological need (food)
  2° drive = temporal want (or assumed need... $)

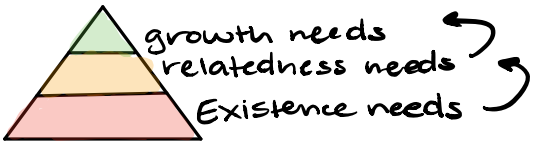
- Needs-Based Theories

  Behavior is done to satisfy urgent needs

① maslows hierarchy of needs



② ERG Theory



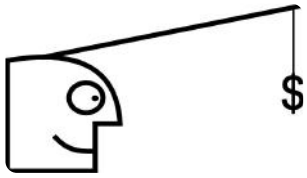
③ Self-determination theory

3 needs

1- autonomy
2- competence
3- relatedness

- Incentive Theory

Behavior is done to recieve rewards or avoid punishment

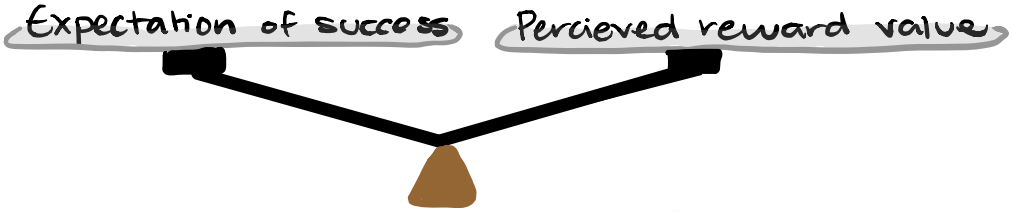


- Cognitive Theory

Behavior is motivated by thinking: plans, goals, expectations.

motivation { Intrinsic = personal unseen motives
Extrinstic = rewards or stimuli

Expectancy - Value Theory



OPPONENT PROCESS THEORY

↓ Homeostatic Principles

+ heroin 5mg = high x3

+ heroin 5mg = no high

+ Heroin 10mg = high x3

+ heroin 10mg = no high

+ heroin 20mg = high

↓ etc.

↓ addiction

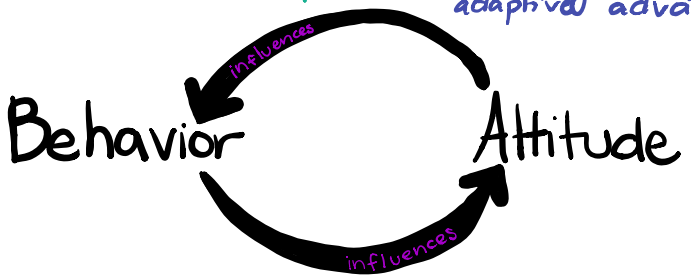
The body attempts to maintain homeostasis by mounting an opponent process opposite the heroin. These come earlier + earlier and stronger requiring more drug.

Attitude

- Cognitive
- Affective (Emotional)
- Behavioral

functional attitudes theory

1. Knowledge → attitudes give us valuable knowledge of people, events, outcomes
2. ego-expressive → one route to expressing identity
3. adaptive → socially-acceptable attitudes have an adaptive advantage.



Self-Perception Theory actions → attitudes b/c people infer their attitudes by observing their behavior

Foot-in-the-Door behavior → attitude : a person is more likely to agree to something if you've gotten them to agree to something smaller first.

Role-playing Effects behavior as an actor → attitude adopt roles you play

↳ Zimbardo prison study

Learning Theory of Attitude Change

Attitudes can be changed by learning

- classical conditioning
- operant learning
- observational learning

Dissonance Theory of Attitude change

Attitudes change as a means to reduce Cognitive dissonance.

Elaboration-likelihood Model of Attitude change

Centeral Route

thoughtful consideration of information presented
- lasting changes
- open-minded needed

Peripheral Route

early impressions of changes
- short lived effects
- no open mind needed

Social Cognitive Theory of Attitude Change

observational learning

⇓

change

Learning

Characteristics Model

(to affect attitude change)

Target

Person recieving message

Source

Person delivering message

Message

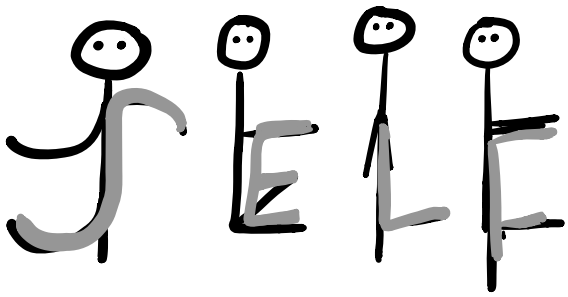
words or information presented

Cognitive Routes

nature of the approach

main route = evaluation of info

peripheral route = Credibility of source.



- Self esteem: my value
- Self-image: my appearance
- Self-identity: my idea of who I am
- identity: who I am
- Self-schemas: how my ideas of who I am are used to categorize new information
- self-efficacy: my ability (and confidence in my ability)
- self-concept: my total concept of myself.

Identity formation

Kohlberg's Theory of Moral Development:

Stages:

1) Pre-conventional Mortality (pre-adolescence)
   ↳ Obedience, self-interest
2) Conventional Mortality (adolescence to adulthood)
   ↳ conformity, Law and order
3) Post-conventional Mortality (adulthood)
   ↳ Social Contract, Universal human ethics

Erickson's Theory of Psychosocial Development

Psychosocial identity development over our whole life.
- ↳ outer social vibes
- ↳ inner emotional vibes

Childhood (4 stages)

1. Trust vs mistrust (1st yr of life)
   - ↓ loving parents
     - *mother*
   - ↓ ignored or abused

2. Autonomy vs shame & doubt (2-3 yrs)
   - ↓ discover ourselfs
     - ↳ confidence
     - *both parents*
   - ↓ not allowed to discover (shamed)
     - ↳ self-doubt

3. Initiative vs Guilt (4-5 yrs)
   - ↓ encouraged to follow our interests
     - *entire family*
   - ↓ held back or discouraged

4. Industry vs inferiority (5-12 yrs)
   - ↓ realize we are diffent and aim to do things right
     - ↓ positive feedback and praise
       - ↓ industrious
     - *neighbors + schools*
   - ↓ negative feedback
     - ↓ lose motivation

5. Identity vs role confusion (13–19 years)

- Identity → different social roles "identity crisis" → explore!! → identity
- role confusion → Forced to see one way of thinking

adolescence (1 stage)

peers + role models

adulthood (3 stages)

6. Intimacy vs Isolation (20–40 yrs)

- Intimacy → understand who we are + form a long-term relationship
- Isolation → cannot make a commitment (lonely)

*friends + partners)

7. Generativity vs Stagnation (40-65 yrs)

- Generativity → Contribute to society, believe we can lead the next generation in this world
- Stagnation → experience negativity and opposition to becoming new leaders

ppl @ home + at work

8. Ego Integrity vs Despair (65+)

look over our life →
- I didn't live a good life
- I did live a good life!

Freud saw heterosexual relationships as healthy + natural.

Freuds Psychosexual Development

① Oral: 0yrs - 1. Libidinal energy centered on mouth

② Anal: 1 – 18mo. Anus = erogenous zone (toilet training = source of conflict)

③ Phallic: 3-6 yrs. 1st sexual feelings

④ Latency: sexuality is supressed + children focus on same-sex parent + friends

⑤ Genital: Genitals become source of pleasure in relationships

heterosexual ←

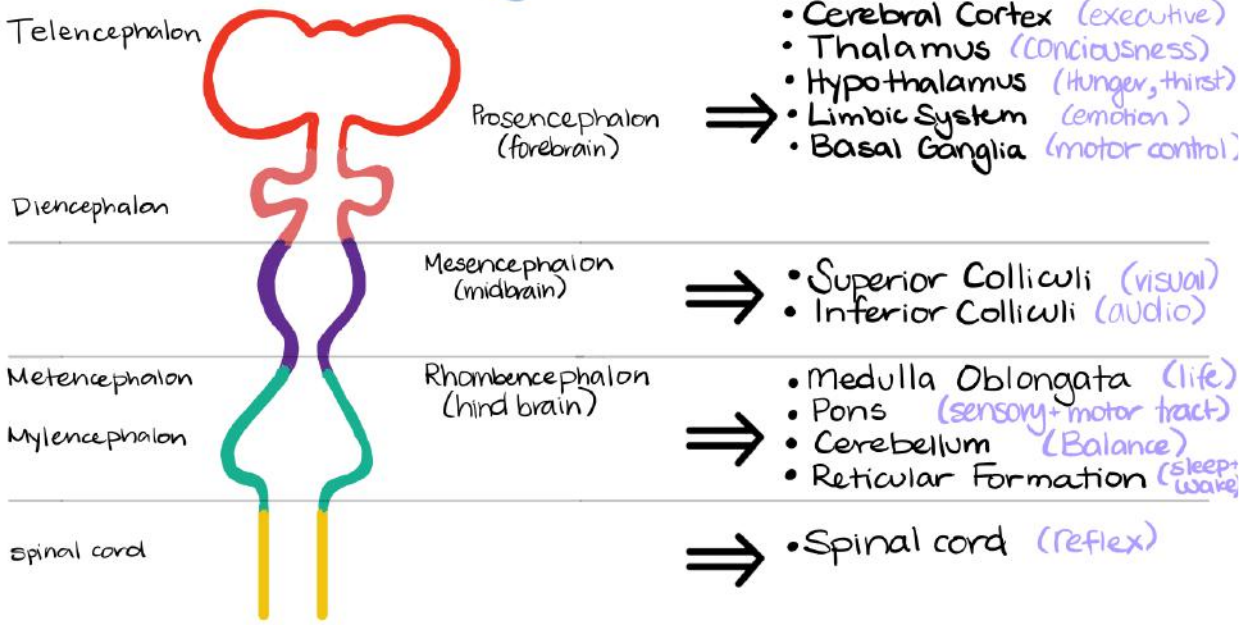
Social Identity Theory

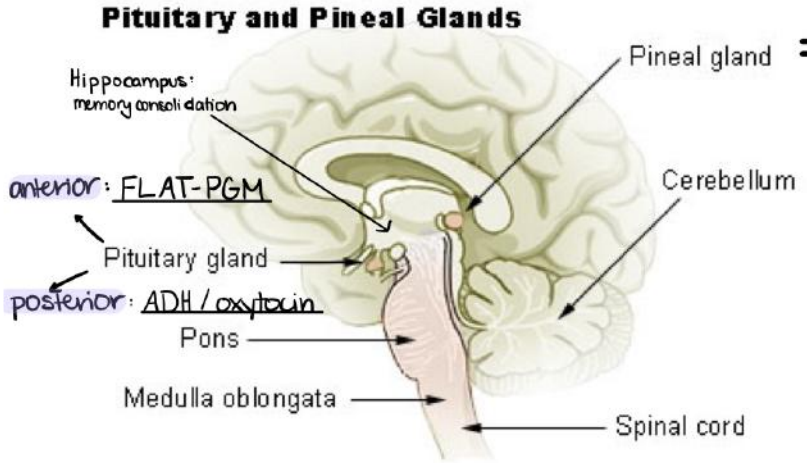
individuals develop pride and self-esteem from group membership.
↓
increase ingroups
↓
discriminate outgroups

Role Taking: adopting & acting out a social group
ie: "cops + robbers"

Looking Glass Self: How a person believes others see them.
(not how we see ourselves)

Nervous System





⇒ Forebrain:
- Melatonin
- sleep regulation

Terms

Contralateral → Left side functions are processed by the right brain.

Ipsilateral → Information transmission to the same side of the brain.

Methods to Study the brain:

Non-Invasive

- EEG
- Transcranial Direct Current Stimulation (TDCS)
- Regional Cerebral Blood Flow (rCBF)

Invasive

- Direct Electrode Simulation (Brain Surgery)
- Brain Injury Case Study
- Extirpation of animal brain regions.

~Neurotransmitters~

- **acetylcholine**
  - ↓ ach = alzheimers (association)
  - CNS > ↑ arousal, attention
  - PNS → Neuromuscular Junction
- **epinephrine** — PNS
  - ↑ stress = ↑ ↑
- **norepinephrine**
  - ↑ stress = ↑ ↑
  - CNS, PNS > attention, emotional processing
- **dopamine** — CNS – sensorimotor integration, reward processing
  - Parkinson's, tourettes, Huntington's, Schizophrenia
- **seratonin** — CNS – regulation of sleep and appetite and mood
  - ↓ Seratonin = depression
- **GABA** → inhibitor → CNS

psychological disorders

Biomedical Approach: "treat the problem"

⇒ Disorders can be caused by biological or chemical dysfunction.
- Genetic Predisposition
- Low hormone / neurotransmitter levels

⇒ Treatments are biochemical
- surgery / drugs

⇒ Considered more "narrow"

⇒ Focuses on relieving symptoms

Biopsychosocial Approach:

"treat the patient"

⇒ Disorders caused by combination
biochemical (genetic, hormone levels)
psychological (personality, behaviors)
sociological factors (culture, peers)

⇒ Treatments include targetting all categories.

⇒ More broad and widely accepted by psychologists

⇒ Focuses on solving underlying causes

personality disorders

Cluster A

Paranoid Personality disorder (Disruptive) → Truly symptoms of mistrust and paranoia.
Schizotypal Personality disorder (Distorted) → "magical" thinking in one being able to see future events or such.
Schizoid Personality disorder (Disrupted) → severe detachment and cold withdrawn behavior.

Cluster B

Antisocial Personality disorder: violating rights of others, animal cruelty, aggressiveness, abnormal feelings towards others.
Severe
↳ sociopath: severe deficit of conciousness
↳ psychopath: entire lack of conciousness.

Borderline Personality disorder: Instability in relationships and self-image. Self-harm and suicide are common
Histronic Personality disorder: Attention seeking, shallow emotions, innappropriate flirtation, vicarious, emotional outbursts.
Narcissistic Personality disorder: excessive sense of self-importance, lack of empathy, constant need for praise and attention.

Cluster C

Avoidant Personality disorder: extreme shyness and sensitivity to criticism, low self-esteem, difficulty forming relationships (other than immediate family)
Dependent Personality disorder: Needy behavior, seeking excessive approval. Extreme devistation after break-ups.
Obsessive-Compulsive Personality disorder: Chronic obsession with perfection, control, and order.

Psychoanalytical Personality Theories

FREUD

~ID~

- 100% unconcious
- Responsible for instinct behavior
- 1 of 3 components present from birth.
- Most important aspect of personality

Primary Process → deals with delayed gratification as it serves as a remedy of an object until gratification is reached.
wish fulfillment → seeking to satisfy unmet desires through dreams.

- libido "psychic energy" created by sexual energy

~Ego~

- Concious, pre-concious, and unconcious realms.
- Helping the Id be realized in real-life scenarios.
- Not present from birth. Id develops the Ego.

Secondary Process → ego's attempt to satisfy demands represented by primary process.
Reality Principle → delay Id's gratification until an appropriate time.

~Superego~

- concious, pre-concious, and unconcious realms
- judging action based on internalized moral standards
- "perfectionist"
- age 5

Ego Ideal → standards for the ego to conform to. What a person should want to be.
Conscience → rules and admonishments for bad behavior.

JUNG

Archtypes : images & thoughts with universal meaning

- Self ⇝ concious + unconcious mind is unified
- Persona ⇝ how one presents themself to the world.
- Anima ⇝ the female in a male
- Anima ⇝ the male in a female.
- Shadow ⇝ uncertainty + danger (alluring)

Dichotomies : "Personality Tests"

- Extroverted vs. introverted
- Sensing vs. intuiting
- Thinking vs. feeling

Extroverted-Sensing, Introverted-Sensing
Extroverted-Intuiting, Introverted-Intuiting
Extroverted-Thinking, Introverted-Thinking
Extroverted-Feeling, Introverted-Feeling

ALFRED ALDER AND KAREN HORNEY

A Neo-Freudian, Adler espoused a much more optimistic view of human nature than did Freud. As such, Adler believed that all human behavior was guided through a process of self-improvement and success and that each individual's personality was forged through his/her choices and was often motivated by feelings of inferiority that each of us experiences in some aspect of our lives. This is known as the concept of creative self and it helps to forge a person's style of life, or unconscious patterns of behavior in dealing with all aspects of life. Adler believed that Freud's focus on childhood experiences and their role in establishing adult personality represented fictional finalism because this approach ignores the active role that individuals play in determining their own personalities. Individuals who fail to use their feelings of inferiority as motivation for self-improvement may experience an inferiority complex by which they feel entirely overwhelmed and powerless as a result of their shortcomings. Karen Horney was another Neo-Freudian who parted with Freud's views on a number of counts. For one, Horney refused to accept that sexual and aggressive urges were the key factors in determining someone's personality, and she rejected the emphasis that Freud and his follower's placed on the male sex organ. As such, she took a much more humanistic view of personality. One of Horney's major contributions to psychology involved her theory of neurosis. According to Horney, neurosis results from basic anxiety which results from troubles in personal relationships that stem from childhood. If a child perceives that they did not have their needs met by their parents, then they would experience basic hostility towards them. This hostility would serve as one source of the basic anxiety that they feel in other relationships. As people try to cope with this anxiety, they may fall into a rut in terms of their coping mechanisms of choice which could be construed as a series of neurotic needs (e.g. the need for approval, the need for power).