

PSYCH 1X03

Levels Of Analysis

Introducing Psychology

- The brain
- Sensation and perception
- Memory
- Language
- Animal behaviour
- Friendship and attraction
- Stress and health
- Child development

Common Goal: Understanding human thought and behaviour.

Psych teaches us how we think, feel, develop, learn, interact, and grow.

Psyche: soul

Logos: study of

Psychology's Parents

1. Philosophy's Influence

- a. Descartes proposed that the mind controlled the movements of the mechanical body and the mind in turn received info about the outside world through sense organs

2. Physiology's Influence

- a. Muller studied the messages that nerves transmit and concluded it was coded as electrical impulses that travelled along different channels
- b. Particular parts of the body are connected to specific areas of the brain to serve different functions
- c. Experimentally supported by Flourens who used a technique to systematically destroy different regions of an animal's brain to study its function
- d. Learned which brain regions control heart rate, breathing, and processing of visual and auditory reflexes
- e. Helmholtz measured the speed of the nerve impulse and found it to be 90 feet/second (much slower than electrical current flowing along a metal conductor)

Psychology As An Independent Field

Wilhelm Wundt

- 1879: Opened the first lab devoted to the study of psychology
- Believed that conscious experience could be studied using the same experimental tools that chemists/physicists use to study their research questions
- 1881: Launched first scientific journal devoted to publishing psychological research
- 1883: Hall (student) opened the first psychology lab in North America at John Hopkins University
- 1887: Established the first psychology journal in America
- 1892: Founded the American Psychological Association – world's largest psychological organization with 150k+ members
- Lead to the development of other organizations such as the Association For Psychological Science

Looking Ahead

- Early focus of psychology was on the mind, with little attention paid to the brain
- Today we draw links between the brain and behaviour
- Modern approach draws on expertise from fields including physical, biological, chemical, social, mathematical, and computer sciences

Multiple Levels Of Analysis

- All psychology can be reduced to one question: What would an alien scientist observing human beings conclude about us?
- **[1] Neuroscience**
 - o **Reductionism:** All human behaviour can be reduced to the biology of the brain
 - o Our understanding of the brain is incomplete
 - o Radio analogy: Understanding how the music comes out of a radio by taking the speaker apart and looking at the circuits
 - Understand how the speaker can generate sound
 - Where does the sound come from?
 - o Francis Crick studied this
 - o Early pioneers drilled through the skull to expose the brain
 - o Modern techniques allow us to use less evasive procedures to look at the brain
 - X-rays/CT scans
 - **Neuroimaging:** Noninvasive method used to examine a subject's brain while the subject is fully awake
 - Structural neuroimaging shows the physical makeup of the brain
 - o Ex. Do men have a larger brain than women?

- Functional neuroimaging shows what the brain is actually doing
 - Ex. Do men and women use the same areas of the brain to perform a particular task?

- [2] Learning

- Pavlov's bell/dog experiment
- Cues and behaviour
- **Structuralism** – to understand the structure of consciousness in its basic elements and how they're related
- Individuals were trained to observe their own experiences and report through a method called introspection
- **Functionalism** – sought to understand the function of consciousness which needed to be studied as a stream
- Argued that Structuralists were using unscientific methods and were missing the point by dissecting consciousness into individual elements
- **Behaviourism** emerged
- Watson (father of) is credited with formalizing the methodology of learning research
- Overt behaviour is the only valid means of measure in psychology
- Scientists should consider the mind to be an off limits "black box" that takes input and makes output
- What happens in the "black box" is outside the domain of science
- Focused on designing controlled experiments to understand the influence of environment on behaviour
- Firmly believed in the role of the environment on determining behaviour
- Favoured the influence of nurture over nature in determining human behaviour
- BF Skinner believed one could learn everything about an organism by studying its behaviour
- An organism will repeat a behaviour if it leads to something pleasant and vice versa
- Formed the core of a therapy called behaviour modification

- [3] Cognition

- Proper scientific methods can be used to study internal mental processes and is necessary to fully understand outputted behaviour

- Studies the internal processes of the mind which includes thought, attention, memory, language, and problem-solving
- The mind is an abstract concept that refers to all the conscious and unconscious processing that generates thought and behaviour
- Uses models to construct representations of how the mind functions
- Ex. Single Memory Model (single unlimited storage area where all memories are kept) – finding that would dispute this argument: it's easy for someone to forget what they just learned as opposed to something they've known for years
- Ex. More complex model: temporary short term memory → processing → permanent long term memory
- Ex. Conduct experiments to test the model
- Models provide a framework to describe data and generate testable questions
- No “true” model of the mind, merely the best and most useful model at the given time
- **[4] Social psychology**
 - Study of how individuals are influenced by other people
 - [1] The influence of an individual on a group
 - [2] The influence of a group on an individual
 - [3] The influence of one group on another
 - Ex. How crowds react in an emergency situation
 - Artificial social situation in which there's a perceived emergency
 - Manipulates variables such as the severity of the emergency and size of group
 - Ethical considerations: Distress and deception
 - May have to deceive people to create artificial social situations
 - Experiments must pass the standards of the McMaster Research Ethics Board (ethics committees)
 - Ex. Milgram Experiment in 1963 would not pass
- **[5] Evolution**
 - Evolutionary psychology: How behaviours develop over many generations
 - How genetic and environmental factors contribute to changes in behaviour across the history of a species
 - Ex. How are reproductive behaviours in men and women differently influenced by selective pressures?
- **[6] Development**
 - Developmental psychology: How behaviours develop over the lifespan
 - How genetic and environmental factors contribute to changes in behaviour across a lifespan

- Ex. What factors determine the different rates of alcoholism in individuals and populations?
- Ex. At what age can an infant tell people apart?
 - **Habituation:** Present pictures of one person repeatedly until the infant becomes bored and spends less time looking at the picture
 - Then present a new picture
 - If the infant shows renewed interest in the new picture, it suggests that the infant recognizes the image as a new image and vice versa

Methodological Case Study: Depression

- Depression is categorized by depressed mood and social withdrawal
- May lead to problems with thoughts and sleep
- **[1] A Neuroscience Approach**
 - Interested in the neural mechanisms of behaviour
 - May ask, “How do changes in the brain lead to depression?”
 - Involves understanding the physical and chemical changes in the brain
 - Identifying a potential drug treatment to reverse changes
 - Structural brain changes that occur in depressed people: hippocampal region of the brain is smaller in depressed patients compared to control subjects
 - Antidepressants target specific brain systems to reverse the brain chemistry abnormalities
- **[2] A Learning Approach**
 - Learned helplessness (inspired by animal research): subjects have learned through repeated trials that they’re unable to escape an unpleasant stimulus; the subject essentially learns that it’s “helpless” and doesn’t try to escape from similar situations in the future, even when there’s a clear course of action to avoid the unpleasant stimulus
 - People who are depressed may have learned in the past that their actions are ineffective for escaping their negative circumstances
- **[3] A Cognitive Approach**
 - Generates models of negative thought processes
 - Considers that depression is caused and maintained by maladaptive thought processes called negative schemas
 - Ex. Negative schema model of depression suggests that depressed individuals are inclined to interpret new info about the world more negatively than others

- May ask, “What negative thoughts are driving depression and how can they be changed?”
- **Aaron Beck’s Cognitive Triad Theory:** Depression is maintained by negative views of one’s self; the world; and the future (may lead to below)
- **Personalization:** A process in which a person may believe that every bad thing that happens is somehow their fault
- **[4] A Social Psychological Approach**
 - Considers the role that other people in a person’s life play in the development, maintenance, and treatment of depression
 - May ask, “How does a person’s relationship affect their depression?”
 - Ex. Someone being alienated from the group
- **[5, 6] An Evolutionary/Developmental Approach**
 - Interested in the development of depression across generations/across the lifespan
 - May ask, “How did a genetic predisposition for depression arise in an evolutionary context?”
 - May ask, “What genetic or environmental factors lead to depression?”
 - Marcello Spinella suggested that in a social species, depression → increased peer support → benefit an individual’s survival
 - Developmental psychologists argue that depression has a strong genetic component
 - If you have a parent who is depressed, you have a higher chance of being depressed
 - If identical twins were raised in different environments, one could become depressed while the other does not
 - Suggests that both genetic and environmental factors contribute to the development of depression

Research Methods 1

The Scientific Method

1. Construct a theory
 - a. General set of ideas about the way the world works
2. Generate a hypothesis
 - a. Testable statement guided by theories that make specific predictions about the relationship between variables

3. Choose a research method
 - a. The way in which the hypothesis will be tested
4. Collect data
 - a. Taking measurements of the outcomes of the test
5. Analyze data
 - a. Understand the data and discover trends or relationships between the variables
6. Report the findings
 - a. Publish articles in scholarly journals
7. Revise existing theories
 - a. To include new info into our understanding of the world

Paradigm Shift: A dramatic change in our way of thinking (ex. 1543 – Copernicus challenged the existing dogma that the Earth was at the centre of the universe).

MegaStudy Drink

Theory: Test performance can be affected by external factors that occur while studying for the test.

Hypothesis: Students taking energy drink should show improved test performance when compared with students not drinking energy drinks

Anecdotal Evidence: Evidence gathered from others or self-experience.

Problems With A Makeshift Experiment:

1. Single experience might not be representative
2. Personal experience might not represent others
3. Cannot be sure that result is due to energy drinks alone

Experiment: Scientific tool used to measure the effect of one variable on another.

Independent Variable: Variable manipulated by the scientist (ex. Energy drink).

Dependent Variable: Variable being observed by the scientist (ex. Test scores).

Control Groups: Used to measure the effect the independent variable has on its subjects. They are not given the experimental manipulation.

Within-Subjects Design: Manipulating the independent variable within each participant to minimize the effect of external variables on the dependent measure (ex. Eric becomes his own control group).

Practice Effect: Improved performance over the course of an experiment due to becoming more experienced (ex. The subject's performance could improve over the course of an experiment, thus it becomes difficult to distinguish between a person's natural improvement and the independent variable).

Between-Subjects Design: One group of participants receive experimental manipulation while another group acts as the control group.

Confounding Variable: A variable other than the independent variable that has an effect on the results.

Sampling: Results from very specific groups of participants cannot be generalized to other groups.

Population: The general group of people we are trying to learn about (ex. Undergrads @ Mac).

Sample: The selected members of the population that we actually collect data from (ex. 40 individuals).

Random Sampling: Best way to choose participants because this way we reduce the chance that our selections might be biased towards a specific group.

Random Assortment: Assigning participants to either the experimental or control group at random to avoid any biases that may cause differences between the groups of participants.

Placebo Effect: Occurs when an individual exhibits a response to a treatment that has no related therapeutic effect (ex. Patients showing recovery from illness when given drugs that were presented as "miracle cures" even when these drugs were known to have no effect).

Participant Bias: The above is a form of this, which can influence the results of the experiment.

Blinding: When participants don't know which group they belong in.

Experimenter Bias: Actions made by the experimenter to promote the result they hope to achieve.

Double-Blinding: Neither the experimenter or participants know which group each participant belongs in.

Research Method: Using the between-subjects design and double-blinding.

Collecting Data: Having both groups write the test.

Research Methods 2

Descriptive Stats: Statistics allow us to summarize, interpret, and present the data we've collected.

Types Of Descriptive Stats

- [1] Measures Of Central Tendency

- Summary stats: mean, median, mode
- Histograms, bar graphs, pie charts, Venn diagrams
- **Histogram:** Type of graph used to report the number of times groups of values appear in a data set. The x-axis is divided into groups of values called bins. The y-axis measures the number of times that a value in the data set falls into a given bin, known as the frequency.

Frequency Distribution: Type of graph illustrating the distribution of how frequent values appear in the data set. A histogram is often used as a base to create this.

Normal Distribution: A distribution with a characteristic smooth, bell, and symmetrical shaped curve around a single peak.

Measure Of Central Tendency (Mean/Average): Tells us where a data set is centred. It cannot tell us how the other values fall around that point.

Outliers: Extreme points distant from others in a data set. The mean is very susceptible to influence by outliers.

Median: The centre value in a data set when the set is arranged numerically. It cannot be pulled in one direction by an outlier.

Mode: The value that appears most frequent in the set. It tells us the most typical response when looking at a data set, and is the only one of the stats that can be used for non-numerical data sets (ex. Most popular ice cream flavour).

- [2] Measures Of Variability

- Smaller spread = smaller standard deviation
- Larger spread = larger standard deviation
- The standard deviation of a set is the measure of the average distance of each data point from the mean

Measure Of Variability: Review the spread and distribution of a data set.

Inferential Statistics

How big must the observed difference be between the groups to be considered an important finding?

Inferential Stats: Allow us to use results from samples to make inferences about overall, underlying populations.

T-Test: A basic inferential stats technique used to compare the difference between the data from the control and experimental group. It is a statistical test that considers each data point from both groups to calc the probability of getting the results by chance if there is in fact only one distribution underlying both groups in the experiment.

P-Value: A value expressing the probability calculated by the t-test.

Statistically Significant: If the resulting p-value is less than 0.05. There is less than 5% probability to obtain the data by chance. In other words, we are 95% confident that a difference between the two groups exists.

Statistical Significance: When the difference between the two groups is due to a true difference between the properties of the two groups and not due to a random variation.

Analyzing Data: Eric gets a p-value of 0.44, which is too high for him to conclude that his hypothesis was correct.

Observational Research

Observational Studies: Scientists observe the effect of variables they're interested in without performing any manipulation (ex. When scientists cannot perform an experiment due to ethical concerns).

Correlation: A measure of the strength of the relationship between two variables (ex. When a scientist conducting an observational study finds that two variables are related to each other, we say that these variables are correlated).

Perfect Positive Correlation: $r=1$

Perfect Negative Correlation: $r=-1$

Correlation Coefficient: Measures the degree with which two variables are correlated and is symbolized by the letter r . If r is close to 0, then it indicates that there is no relationship existing between the two variables.

- Correlation \neq causation

Classical Conditioning 1

Types Of Learning

- Classification by the learning processes in general (the forming of contingencies)
- The learning that is happening within the brain is not a process that is consciously chosen to be experienced
- Behaviour is changed/shaped by the learning processes

1. Conscious

2. Unconscious

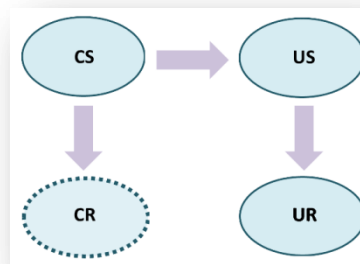
- a. Classical conditioning (Pavlovian conditioning)
 - i. Allows us to associated two related events
 - ii. Involves involuntary/subconsciously driven behaviour (ex. Vomiting, fear)
 - iii. Type of behaviour that learning is applied towards: involuntary, subconscious
- b. Instrumental conditioning
 - i. Allows us to associate actions and consequences
 - ii. Involves voluntary/consciously controlled behaviour (ex. Choosing to be polite, dogs learning tricks)
 - iii. Type of behaviour that learning is applied towards: voluntary, conscious

Ivan Pavlov

- Created the foundation for classical conditioning
- Experiment: Metronome sound would signal food for the dog
 - o Interested in the stages of digestion
 - o Dogs would salivate before the delivery of food in their mouth
 - o Early step in process of digestion was triggered before food stimulus arrived
 - o Prior to training, the sound had no effect on the dog
 - o After training, the dog would salivate in response to the sound alone
 - o This behaviour is called a conditional reflex
- **Contingent Relationship:** The presentation of one stimulus reliably leads to the presentation of another.

- An organism can respond to the signal before the event occurs
- Can promote survival (ex. Salivating before the food arrives makes digestion more efficient)
- A contingency has been formed between the two stimuli when an organism learns the association between a signal (metronome sound) and an event (food)

Classical Conditioning: The learning of contingency between a particular signal and a later event that are paired in time and/or space (ex. Imagining a juicy lemon will make humans salivate for two purposes: to neutralize the citric acid and prepare the body for digestion because we have learned a contingency between the sight of a lemon and the act of citric acid meeting in your mouth from past experiences).



Unconditioned Stimulus (US): Any stimulus or event that occurs naturally prior to learning, which triggers a response.

Unconditioned Response (UR): Response that occurs after the US and occurs naturally prior to learning (ex. Often a biologically programmed reflex or natural response).

Conditioned Stimulus (CS): Paired with the US to produce a learned contingency.

- It's a previously neutral stimulus, that after becoming associated with a US, eventually comes to trigger a response on its own
- CS typically appears before the US and may take several trials of training in which the CS and US are paired before the CS alone triggers a response

Conditioned Response (CR): Response that occurs once the contingency between the CS and US has been learned.

- Often similar to the UR
- Ex. When CR differs from UR
- CS is the airplane food
- US is the rotten food

- CR is avoiding the airplane food
- UR is vomiting

Example 1

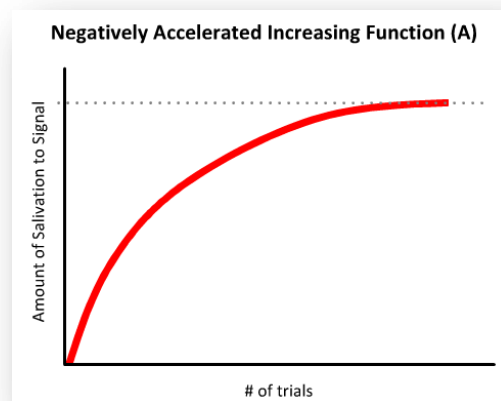
- CS is the sound of the metronome
- US is the food in the dog's mouth
- CR is salivation
- UR is salivation

Example 2

- CS is repeated images of a lemon
- US is past experience with citrus foods
- CR is salivation
- UR is salivation

Acquisition (In CC): Process by which a contingency between a CS and an US is learned.

- A negatively accelerated increasing function with CR on the y-axis and trial #s on the x-axis
- Most of the learning occurs in the earliest trials



Rats

- Acquisition takes one trial
- Developed special learning mechs for food selection to help survival:
- [1] Dietary neophobia: avoid unfamiliar foods
- [2] Consume small quantities
- Can pinpoint a specific food with illness
- Learns contingency between food and sickness in one trial
- CS is taste
- US is sickness
- CR is aversion
- UR is aversion

- The rat will show a strong aversion response before the sickness ever occurs due to this contingency

Extinction (In CC): The loss of CR when the CS no longer predicts the US (ex. Presenting the dog with a metronome and no food).

Case 1: Previously learned contingency is unlearned



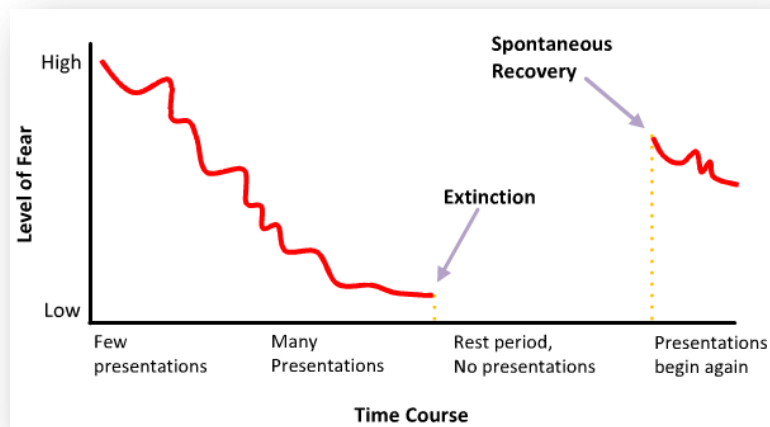
- Strength (CR) is steadily decreasing over time
- Following extinction, retraining between the CS and US would lead to acquisition of the CR at the same rate as the original training

Case 2: Old learned contingency remains, which competes with a new inhibitory response that is learned to the CS

- Following extinction, learning of an inhibitory response to the CS suggests that there exists two learned processes
- [1] Original learned response to the CS
- [2] New inhibitory learned response to the CS
- Retraining between the CS and US would occur at a faster rate compared to original training

Spontaneous Recovery

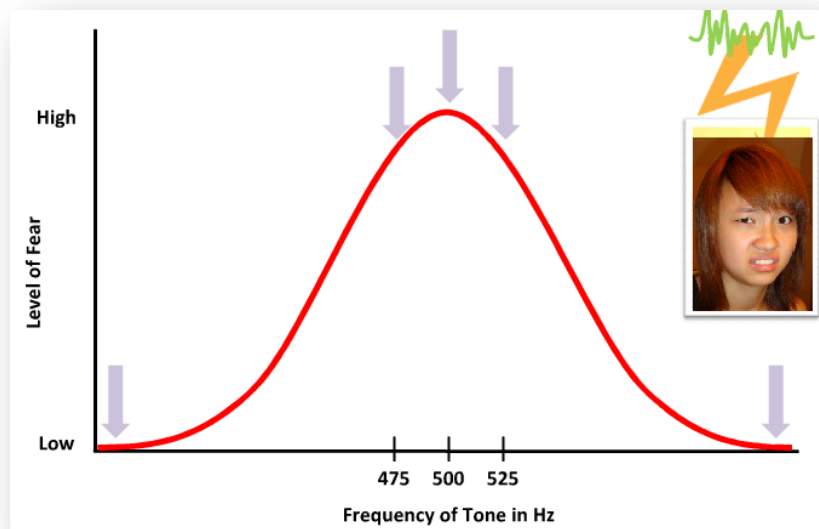
- Suggests that extinction involves a new inhibitory learned response
- The CR gradually fades following an extinction procedure
- Following a rest period, the CS is presented again, and it once again elicits a CR



Classical Conditioning 2

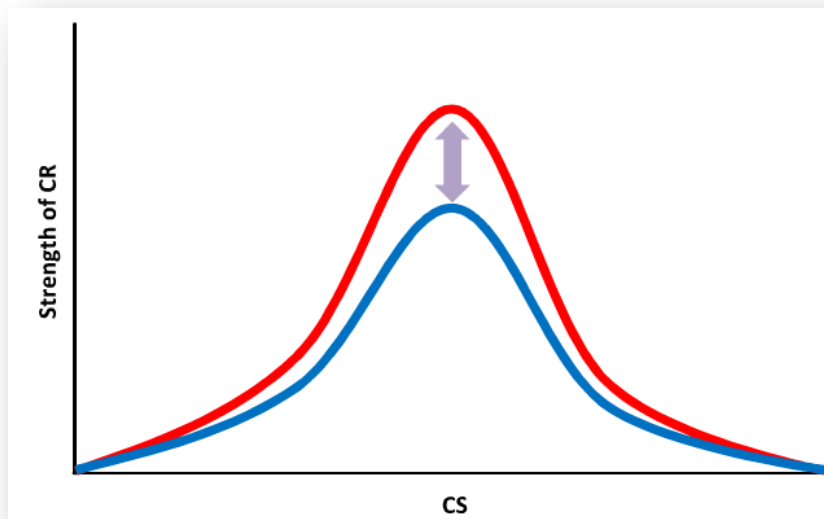
Stimulus Generalization: A process in classical conditioning of learned responses to a variety of different stimuli (ex. Stimuli similar to the CS will often produce a CR).

- Ex. Pairing a 500 Hz tone with an electrical shock
- Once the contingency has been established, we can test for stimulus generalization by presenting various tones and measuring the fear CR
- A normal distribution is observed
- Strongest CR is elicited by the original 500 Hz

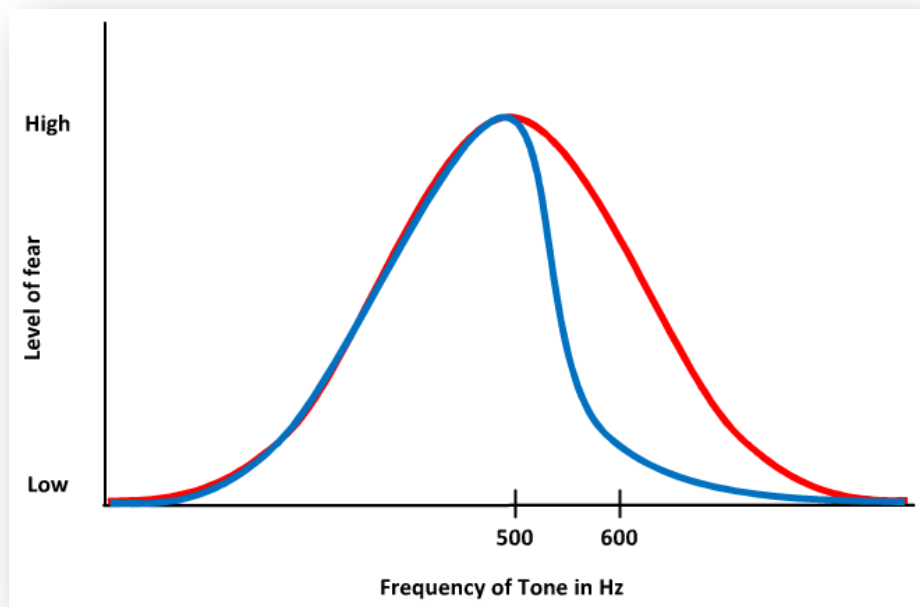


Stimulus Discrimination (In CC): Narrows the range of CS that can elicit a CR.

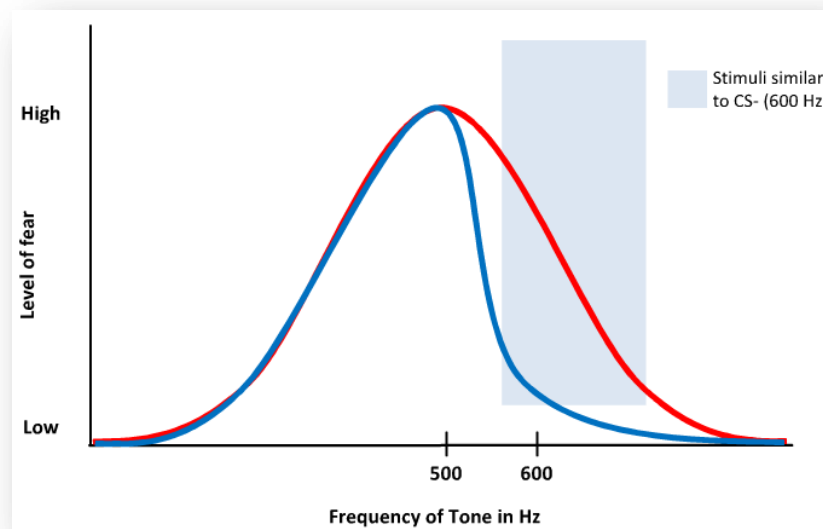
- Ex. Continually presenting Jill with the 500 Hz tone and no shock



- Ex. Presenting Jill with tone frequencies at the far ends of the graph with no shock



- Ex. Eliminating Jill's fear of 600 Hz tones while maintaining her fear of 500 Hz tones by repeatedly presenting a 600 Hz tone in the absence of the electrical shock



- CS- predicts the absence of shock
- CS+ predicts the presence of shock

- Presenting the 600 Hz tone in the absence of shock with alternating trials of presenting the 500 Hz tone in the presence of shock will achieve a precise discrimination in which the fear response is pinpointed to the 500 Hz tone

Learning About Absences/Presences

- Ex. Presenting a CS+ of 500 Hz with a CS- of 600 Hz will cause Jill to show an intermediate fear response (somewhere between the two cues)
- Explain how classical conditioning help:
 - o [1] Antelopes forage on a grassy savannah plain
 - o [2] Commuters dodge traffic on a busy street
 build complex responses that allow adaptive interactions with the environment

Phobia Treatment

Phobia: Exaggerated, intense, and persistent fear of certain situations, activities, things, or people (ex. Claustrophobia).

Implosive Therapy: CS is presented in the absence of the associated US and the individual is encouraged to confront the fear CS (ex. An individual with a particular phobia is encouraged to confront the fear CS that evokes their anxiety).

- Ex. Someone with a germ phobia will be asked to sit with their hands covered in dirt for as long as possible
- Could be a traumatic experience for the individual

Systematic Desensitization: A gradual exposure to the feared CS by starting with extinguishing a CS at the ends of the generalization gradient.

- Ex. From the previous example, the individual will be asked to sit with their hands covered in confetti instead
- More acceptable to patients

Other Conditioning Therapies

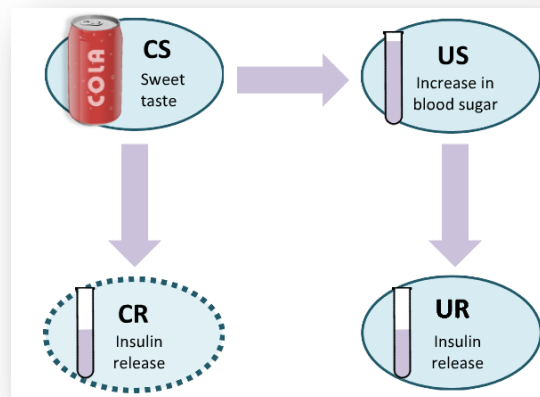
- Ex. An alcoholic may be given a drug treatment in which Antabuse is placed in their drinks
- This gives them extreme nausea in hopes that they will associate this sickness with drinking and cease to drink in the future

Homeostasis: A process in which the body is actively regulating its core temperature, glucose and ion levels, and numerous other processes within strict parameters.

- Made more efficient through classical conditioning

Compensatory Response: A process which counteracts a challenge to homeostasis (ex. Release of insulin).

- Ex. You drink a sugary beverage
- Shortly after, blood glucose levels rise and insulin is released into the bloodstream to take up excess glucose to be stored
- This process regulates blood glucose levels and maintains homeostasis



Addictions

- Ex. Morphine is used to decrease pain and respiration
- After many drug-taking trials, a contingency will form between the CS of the environment and the US of the drug effects
- A presentation of the environmental cues will trigger the CR
- Therefore, a morphine addict with an empty syringe will experience nausea and pain (opposite normal drug effect)

Drug Tolerance: A drug's effect will decrease over repeated drug exposure.

- Drug tolerance is a reflection of the UR and the CR that counteract the drug effects
- Each drug-taking trial increases the strength of the CR
- Drugs taken in a novel environment means that the drug effects are only countered by the natural UR, which could lead to an overdose
- Withdrawal is expressed as an unopposed CR
- Relapse may occur when the individual is exposed to previous environmental cues

Instrumental Conditioning 1

Instrumental Conditioning: The learning of a contingency between behaviour and consequence (ex. Touching a hot stove will burn).

- Proceeds best when the consequence immediately follows the response

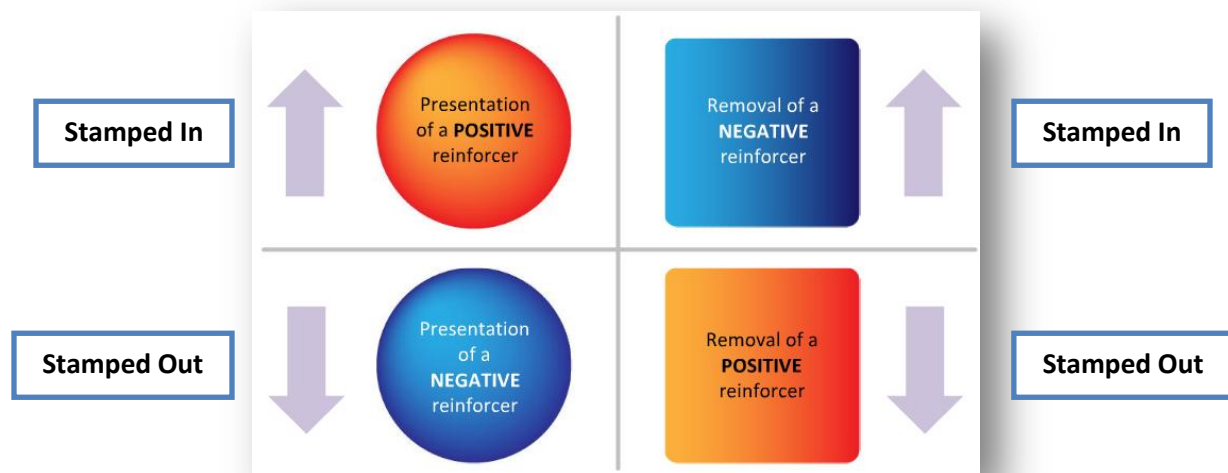
Edward Thorndike

- Studied cats in a puzzle box
- Measured the time it took the cat to learn to open the door by pulling the string
- Put the focus on overt behaviour rather than on mental elements
- Puzzle box was a small chamber with a door that could be opened by performing a specific behaviour (ex. Pulling a rope)
- Outside the box was a dish of food used as motivation for the cat to escape
- Predicted that the cat would first engage in random behaviour as they tried to escape
- Trials following the discovery of the correct solution would lead to a dramatic step down in time to escape
- Discovered that the frequency of random behaviours gradually decreased over time
- Suggested that animals followed a simple stimulus-response type process (long trial-and-error process of discovery) unlike humans
- **Stamping In/Out:** A process which determines whether a behaviour was maintained or eliminated (ex. Pulling the rope was stamped in because it was followed by the favourable consequence of access to food).

Law Of Effect: Behaviours with positive consequences are stamped in and those with negative consequences are stamped out.

Four Consequences

- To define the satisfying/annoying states, which determine the frequency of a behaviour
- **Reinforcer:** Any stimulus, which, when presented after a response, leads to a change in the rate of that response.
- [1] Presenting a positive reinforcer
- [2] Removing a positive reinforcer
- [3] Presenting a negative reinforcer
- [4] Removing a negative reinforcer



Reward Training: Presentation of a positive reinforcer following a response (ex. Give Jill 30k NX every time she does her math homework <3).

- Behaviour is likely to increase

Punishment Training: Presentation of a negative reinforcer following a response (ex. KSing someone in MS leads to auto mesos loss).

- Behaviour is likely to decrease
- Controversial issue and must consider ethics of experiencing pain/fear
- Skinner believed that when using punishments, a contingency may be formed between the authority figure and pain (thus damaging a parent-child relationship)

Omission Training: Removal of a positive reinforcer following a response, which leads to a decrease in the behaviour being reinforced (ex. Jill loves playing MS and teasing Bob so every time she teases him, her mother turns the game off for half an hour).

- Situation that wants to be avoided
- The game (MS) is a positive reinforcer and removing it will likely cause Jill to stop picking on Bob

Escape Training: Removal of a negative reinforcer following a response.

- A constant negative reinforcer that the learner is motivated to have removed
- By performing a specific response, the negative reinforcer can be removed, which leads to an increase in the target behaviour

- Ex. Jill is a grumpy landlord with very sensitive hearing and lives below a tenant, Bob, playing music in her apartment. She hits the ceiling with a broom and the music stops. Jill has learned that she can avoid the loud music (negative reinforcer) by hitting the ceiling (specific response).

Conclusion

- Ex. Using punishment to train Bob to stop using his right hand
- He receives a shock every time he uses his right hand
- Task would be made difficult if there was a long period between the response of using his right hand and the consequence of receiving a shock

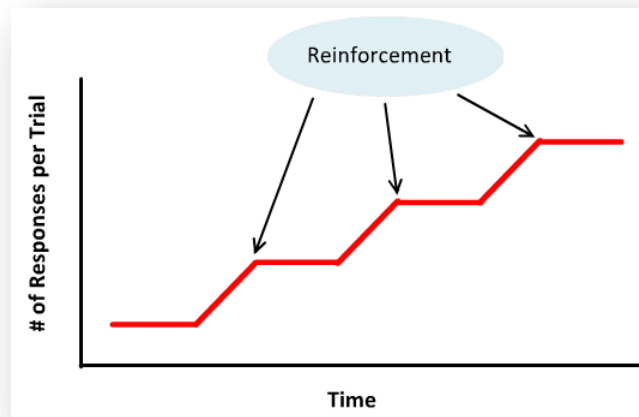


Acquisition (In IC): Learning the contingency between a response and its consequences.

- Psychologists are often interested in measuring the rate of responding of the new behaviour

Graphing Responses

- Ex. Result of reward training
- Flat horizontal line indicates when the subject isn't responding
- Upward slope indicates a response has been made
- Pattern of responding depends on the complexity of the behaviour, type of reinforcement used, and the subject



Autoshaping: A contingency formed between a behaviour and a consequence without explicit training guided by a researcher (ex. A pigeon will learn to peck at a keyhole for grains of seed on its own).

Shaping By Successive Approximation: A technique that organizes complex behaviour into smaller steps and gradually builds up to the full response we hope to condition (ex. If a squirrel can waterski across a pool, he'll receive a food pellet).

- Each step can be reinforced through reward training
- Used extensively by animal trainers

Skinner And Pigeons

- Taught pigeons to play ping pong
- Broke down the complex response into successive components
- [1] Peck at the ping pong table to receive food
- [2] Peck a stationary ball
- [3] Peck a moving ball
- [4] Peck ball across table

Instrumental Conditioning 2

Discriminative Stimulus: Signals when a contingency between a particular response and reinforcement is valid/invalid.

- Ex. Pigeon learns to peck a keyhole to receive food and above the keyhole is a light

- A green light means that the contingent relationship is valid
- A red light means that the contingent relationship is invalid
- SD → green light
- S-delta (S δ) → red light
- SD = response = reinforcement
- S-delta (S δ) = response \neq reinforcement

SD Generalization Gradient: A graph of the range of responses to the SD.

- Ex. Jill has learned a contingency between polite behaviour and reward
- SD is the presence of the parents
- If Jill behaves politely around her parents, she'll be praised and given att'n
- Generalization can occur with her displaying politeness to other adults and authority figures, but less politeness to her peers

Extinction (In IC)

- Ex. Jeff's polite behaviours have always been rewarded by his parents with praise and att'n
- One time, however, his parents were busy and his politeness (and charisma, hehe) went unnoticed
- This creates an extinction process that may lead Jeff to stop responding with his polite behaviour

Discrimination (In IC)

- Ex. One summer, Jeff visits his grandparents who are not accustomed to children and take his politeness for granted
- This may lead Jeff to restrict his polite behaviour responses to the presence of the original SD, being his parents

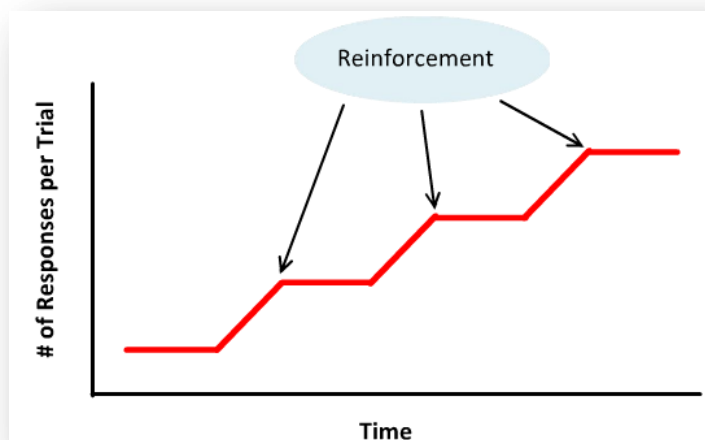
CS Versus SD

- In CC, the CS is paired with the US and the response is involuntary and automatic
 - CS → automatically elicits a response
- In IC, the SD is paired with the response-reinforcer outcome and the response is voluntary
 - The SD sets the condition for a response by signaling when the response-reinforcer outcome relationship is valid/invalid
 - SD → sets the occasion for a response

Continuous Reinforcement: A schedule of reinforcement in which a response leads to a reinforcer on **every** single trial.

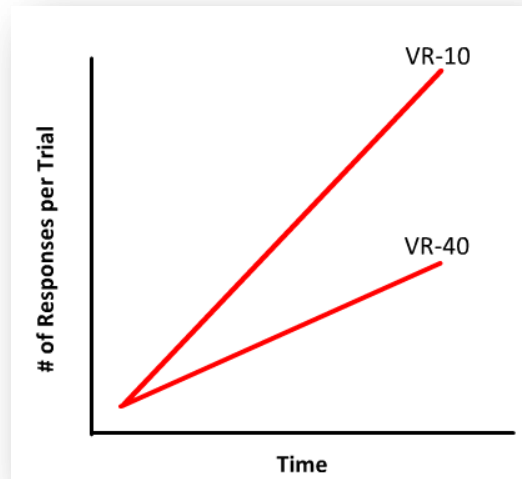
Partial Reinforcement: A schedule of reinforcement in which a response leads to a reinforcer on selective trials (ex. Some good deeds aren't rewarded).

- More realistic
- Reinforcement delivery determined by total work or time
- **Ratio Schedule Of Reinforcement:** Based on the # of responses made by a subject, which determines when reinforcement is given.
 - Fixed schedule
 - Ex. Pigeon on FR-1 schedule is rewarded with food for 1 pecking response and a pigeon on FR-10 schedule is rewarded with food for 10 pecking responses
 - Display a characteristic type of cumulative record called a pause and run pattern
 - Limit to how “stingy” the schedule can be as it'll lead to ratio strain, which causes the subject to stop responding

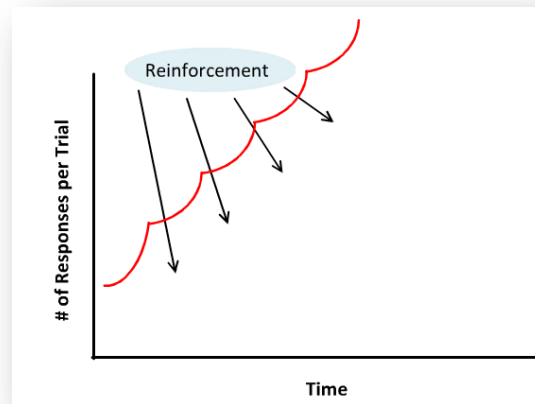


- Variable schedule
 - Ex. Pigeon on VR-10 schedule must peck an average of 10 times to get food reward, but this changes across trials
 - First trial: 12 pecks for food
 - Second trial: 8 pecks for food
 - Third trial: 6 pecks for food
 - Fourth trial: 14 pecks for food

- Display a characteristic type of cumulative record of a diagonal line with no pauses
- Slope of a variable ratio schedule's cumulative record reflects the set average # of responses required before reinforcement is delivered
- VR schedules that deliver more frequent reinforcement will support higher response rates and have steeper slopes

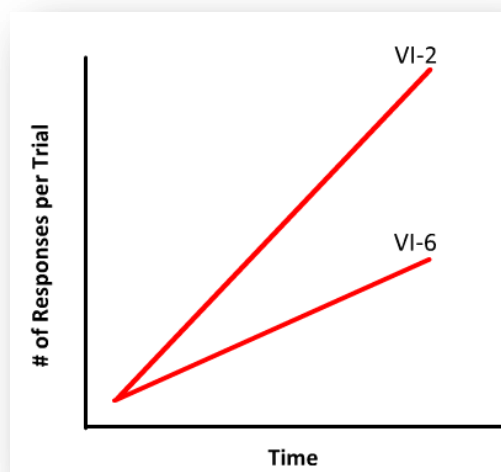


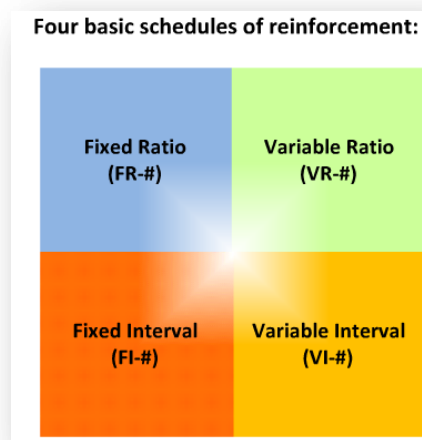
- **Interval Schedule Of Reinforcement:** Based on the time since the last response that was reinforced.
 - Fixed schedule
 - Ex. Pigeon on FI-1 schedule is rewarded with food for the first pecking response after a 1 minute period and a pigeon on FI-10 schedule is rewarded with food for the first pecking response after a 10 minute period
 - Display a characteristic type of cumulative record of a scallop pattern
 - Following reinforcement, there's a lull period in which responding drops and then slowly picks up and peaks just before the reinforcement is scheduled to be delivered



○ Variable schedule

- Ex. Pigeon on VI-10 schedule must have an average of 10 minutes passing before food reward, but this changes across trials
- First trial: 5 minutes for food
- Second trial: 15 minutes for food
- Third trial: 10 minutes for food
- Display a characteristic type of cumulative record of a diagonal line with no pause
- Reinforcement can be received anytime
- Subject tends to respond at a steady rate
- Schedule that delivers more frequent reinforcements has a steeper slope





Extinction And Schedules

- PRF learned behaviours are more resistant to extinction than CRF
- On a CRF-schedule, once reinforcement stops, the subject will immediately be aware of this abrupt change and may decrease responding
- On a PRF-schedule, once reinforcement stops, it's not immediately obvious that an abrupt change has happened

Problem Solving And Intelligence

Intelligence: The cognitive ability of an individual to learn from experience, reason well, remember important information, and cope with the demands of daily living.

- Edwin Boring defined intelligence as being whatever intelligence tests measured
- Psychologists assume intelligence involves the ability to perform cognitive tasks and the capacity to learn from experience and adapt
- Sternberg combined the two viewpoints and formed the definition

Problem Solving

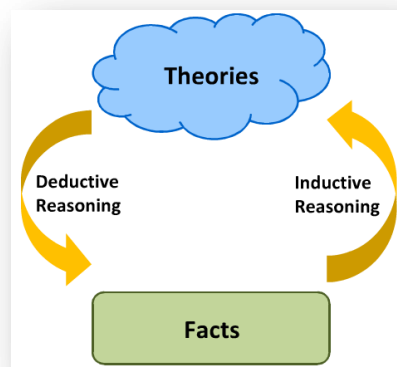
- **[1] Deductive Reasoning**
 - o Idea → Conclusion
 - o Coming to a concrete conclusion based on a general idea
 - o Ex. Jeff tells Jill it's going to rain
 - o Jill uses deductive reasoning to determine that the ground will soon be wet

- **[2] Inductive Reasoning**

- Fact → Idea
- Generating a general idea given some concrete information
- Ex. Jill wakes up in the morning and notices a box of chocolates by her bed
- Jill uses inductive reasoning to determine that Jeff must have put it there

Arch Of Knowledge

- Generating a testable hypothesis with deductive reasoning and interpreting collected data with inductive reasoning
- May lead to revised theories



Insight Problem

- Ex. Given a box of thumbtacks, some candles, and a bulletin board, how do you attach the candles to the bulletin board and light them without setting the board on fire?
- Pin the box to the board with the candles inside
- **Functional Fixedness:** Difficulty seeing alternative uses for common objects.

Qualities Of A Test

- **[1] Reliability**

- A reliable test produces the same results if one person takes it multiple times
- Reliability of a test measures the extent to which repeated testing produces consistent results
- Ex. Periodic Avenue quizzes can be said to be reliable if a student taking repeat versions of the quiz scores a consistently similar result
- Reliability of testing is esp. important for intelligent tests because psychologists assume that intelligence is a static, internal quality

- **[2] Validity**
 - A valid test only measures the trait it's supposed to be measuring
 - Validity of a test measures the extent to which a test is actually measuring what the researchers claim to be measuring
 - Ex. SATs, MCATs, LSATs

Francis Galton

- Started the modern study of intelligence
- Goal was to formally quantify intelligence in an unbiased manner
- Recorded how quickly subjects could respond to sensory motor tasks by their reaction time
- Equated faster reaction times with higher intelligence
- Reliable and unbiased measure
- Validity is questionable

Stanford-Binet Intelligence Test

- Intelligence scale to help identify public school children who needed special education
- Included 30 short tasks related to everyday life

Charles Spearman

- Firm believer in the idea of a single type of intelligence
- Observed that most people who performed well on classical intelligence tasks also performed well on all kinds of tasks
- Reasoned this was the case because there's one generalized intelligence, which he named "G"
- Made excessive claims, such as voting and reproduction should be limited to people with a minimum level of "G" intelligence

Howard Gardner

- 1980s: Proposed a multiple intelligence theory and intelligence test
- Argued that there were eight different types of independent intelligence
- [1] Linguistic (Verbal)
- [2] Mathematical (Logical)
- [3] Rhythmic (Musical)
- [4] Spatial (Visual)
- [5] Kinesthetic (Bodily)
- [6] Interpersonal

- [7] Intrapersonal
- [8] Naturalistic

Wechsler Scales

- Intelligence tests today are patterned from a scale developed by David Wechsler in the 1930s
- Two commonly used tests are Wechsler Adult Intelligence Scale (WAIS) and Wechsler Intelligence Scale For Children (WISC)
- Tests are standardized to produce an intelligence quotient for each individual
- IQ scoring is based on the results of large samples of individuals who have taken the test
- Someone who achieves the mean score will be assigned an IQ of 100
- IQ scores surrounding the mean are assigned around a perfect normal distribution with a standard deviation of 15
- Specific IQ is relative to the performance of the rest of the population

Genetic And Environmental Contributions

- Do the individual differences in human IQ result more from genetic or environmental differences?
- Researchers use correlational studies to answer this question
- Researchers compare identical twins, which have 100% of their genes in common to fraternal twins, which have 50% of their genes in common
- Correlation between IQs of twins:
 - o Identical: +0.80 (strong positive correlation)
 - o Fraternal: +0.60
- Suggests a role for genes in the development of intelligence as well as the environment because 0.60 is a high number
- Researchers compared identical twins in different environments and the correlation was 0.73
- Suggests a strong role of genetics in intelligence development
- Limitations to correlational studies
 - o Researcher cannot possibly consider all the environmental similarities/differences between the different homes the twins were raised in
- Ultimately, both genes and environment contribute to IQ

The Flynn Effect: Raw IQ scores have been on the rise since 1932.

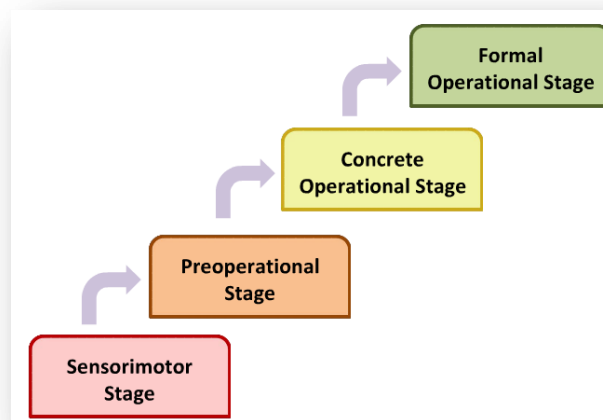
- Mean score for intelligence testing in the population has been steadily increasing since it was first measured in 1932
- Finding has been documented through the years by James Flynn

- Due to increased quality of schooling, access to information/ideas, quality of nutrition and health

Jean Piaget

- Psychologist who developed one of the most influential theories of intellectual development
- Fundamental idea that children are active learners by manipulating and exploring their environments
- **Schema:** A mental framework for interpreting the world around us.
 - o Ex. Jeff frowns at Jill
 - o Jill uses her schemas to interpret that he must not be happy and can act accordingly
 - o Schemas of young children may not be fully developed, thus ignoring the frown
- **Assimilation:** Incorporation new information into existing schemas.
- **Accommodation:** Modifying existing schemas to fit incompatible information.

Four Stages Of Cognitive Development



- Piaget proposed that cognitive development proceeds in four basic stages
- Each stage is characterized by specific abilities and limitations
- Transition from one stage to the next is marked by some changes in the child's schema
- Children can progress through the stages at different rates
- Every child must pass through the stages in the same sequential order
- **[1] Sensorimotor Stage**
- 0 – 2 years

- **Object Permanence:** Realization that objects continue to exist when they're no longer visible.
- Child begins to recognize that he can affect change on his environment
- Child begins to engage with the world and act with intention (ex. Rattle a toy to hear a sound)
- Milestone at the end of this stage is learning object permanence
- **[2] Preoperational Stage**
- 2 – 7 years
- **Limitations:**
 - Egocentrism
 - Difficulty understanding the world from another person's perspective
 - Demonstrated in Piaget's Three Mountains task
 - Child sees three mountains and is asked to choose from a series of pictures what the display would look like from the perspective of someone across the table
 - **Seriation:** Ability to logically order a series of objects.
 - Ex. Cannot rearrange different length cylinders according to height
 - Reversible relationships
 - Ex. Ron and Ginny are siblings
 - Ask Ron if he has a sister → response: yes
 - Ask Ron if Ginny has a brother → response: no
 - Conservation
 - Ex. Fluid conservation
 - Ron sees two glasses of milk and understands they contain the same amount
 - If you pour the milk from one glass into another taller, narrower glass, the child will want the taller glass
 - Ron doesn't realize that it's only at a higher level because the glass is narrower
- **[3] Concrete Operational Stage**
- 7 – 11 years
- Child's schemas are concrete and based on personal experiences with the world
- Child's unable to think in abstract terms or reason based on hypotheses
- **[4] Formal Operational Stage**
- 11+ years
- Able to do everything that make up the range of adult cognitive abilities
- Ex. Children begin to develop an interest in video games

Criticisms

- **Phenomenon Of Decalage:** Finding that children sometimes develop some skills out of order in the strictest sense of Piaget's theories.
- Tasks that Piaget used to formulate his hypotheses relied heavily on the child's language abilities

Bias And Heuristics

Confirmation Bias: Our tendency to seek out information that supports our hypothesis.

- Often feels like the ideal strategy because it helps to amass a wealth of confirming data
- If there is evidence against your hypothesis you must discard/revise it
- Ex. Physician making a diagnosis listens to the patient's description of the symptoms and makes an initial diagnosis
- Physician continues to ask the patient questions
- In this process, the physician is collecting more information that might support her initial diagnostic hypothesis and is focusing on evidence that would confirm her initial diagnosis
- However, the physician is failing to consider disconfirming evidence, thus falling victim to the confirmation bias

Availability Heuristic: Our tendency to base our decisions on the first thing that comes to mind.

- Making a judgment about something based on the information most available to you (ex. Through media sources)
- Ex. Thinking that people are more likely to die from a plane crash than a cold because you hear about that more on the news
- Reliance on heuristics to make decisions causes errors in judgment
- A heuristic is a mental "shortcut" used to solve a problem quickly
- Ex. Thinking that a person with a British sounding accent necessarily comes from the UK

Representativeness Heuristic: Our tendency to assume what we see is representative of a larger category.

- Ex. Assuming every English professor looks like the English professor in your head
- Can be thought of as a stereotype
- You have a representation for a category and judge things to be in that category if they match the representation
- Ex. Brown people smell like curry and everyone who smells like curry must be brown

Language

- Most complex form of communication is language
- Words, dog growling, and parrot mimicking humans are examples of communication
- Most psychologists consider only human communication to be language

Natural Language

- Three criteria outline a “true” language
- **[1] Regular**
- Means that language is governed by rules and grammar
- A sentence can be reorganized and still retain its meaning because the system of rules detail how each word fits with the ones around it
- **[2] Arbitrary**
- The specific sound assigned to represent a concept is completely arbitrary
- Lack of resemblance between words and their meaning
- Ex. A cat is called a “mao” in Mandarin
- **[3] Productive**
- Limitless ways to combine words to describe objects, situations, and actions
- Evident in native language development in infants as they experiment with new words and sound combinations without being taught

Whorf-Sapir Hypothesis: Language influences our thoughts and the way we perceive and experience the world.

- Ex. The 1337 tribe’s language only contains three counting words corresponding to one, two, and many
- According to this hypothesis, they should have trouble with numerical concepts such as three, four, etc.
- Ex. The un-1337 tribe’s language lack specific words to differentiate relatives as they use a single word to describe any senior male relative
- Arguing against this hypothesis, the tribe was able to clearly understand the differences between these individuals, and are able to understand precisely how they’re related to each one

Morphemes: The smallest unit of sound that contains information.

- In sign language, morphemes are identified in units of signs rather than sound
- A single word can be made up of more than one morpheme
- Morphemes themselves can form complete words

- Ex. Tablecloth = two morphemes, tables = two morphemes, table = one morpheme

Phonemes: When morphemes are broken apart into its constituent sounds.

- Ex. Dog has three phonemes: /d/, /o/, /g/

Syntax (Grammar): The rules that govern how sentences are put together.

- Differences in syntactic rules among languages are as varied as the cultures they originate from
- Ex. In French, there is gender assigned to objects

Semantics: Refers to the meaning of each individual word.

- A sentence can have perfect syntactical structure and no semantic meaning
- Ex. The colourless green ideas sleep furiously

Language Development

Milestones Of A Baby	
12 Weeks	Makes cooing sounds
16 Weeks	Turns head toward voices
6 Months	Imitate sounds
1 Year	Babbles
2 Years	Uses 50 – 250 words; uses 2 word phrases
2.5 Years	Vocabulary >850 words

- Babbling is characterized by drawn-out sounds made up of a variety of combinations of vowels/consonants
- May sound like a real sentence/question because of the use of inflection and rhythm in the production of the babble
- Combination progress to become real words

Language Explosion

- 1.5 – 6 years
- Vocabulary increases rapidly and major aspects of language are mastered
- Complexity of syntax continues to improve throughout childhood

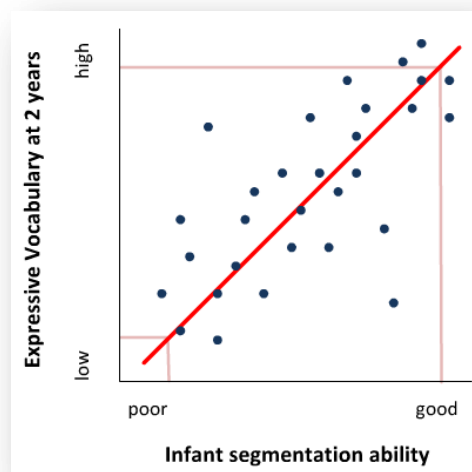
Production Versus Comprehension

- Ex. While an infant progresses to gain language comprehension, language production can be limited by factors such as vocal anatomy
- The infant is unable to express his/her comprehension

- Researchers must consider this extinction
- Method is to test by analyzing infants' behavioural responses to verbal stimuli

Segmentation Problem: Difficulty segmenting the speech stream of an unfamiliar language into word units.

- Problem translates into your perception that a person speaking in an unfamiliar language often sounds as though they're speaking very quickly
- Similar to the disorienting effects of reading a sentence no natural breaks
- Ex. Does an infant's proficiency at speech segmentation predict language ability?



- Researchers began familiarizing infants with a target word and later read stories to them to see if they could detect the target word
- Early speech segmentation skills showed a strong positive correlation with expressive vocabulary

Infant-Directed Speech: Tendency for mothers to use higher pitch and exaggerated changes in pitch when speaking to infants.

- May help infants learn to segment speech

Universal Phoneme Sensitivity: Ability of infants to discriminate between any sounds they're tested on, including sounds from non-native languages.

- Ex. A native English speaker would have no difficulty discriminating between the /ra/ and /la/ phonemes, while a native Korean speaker would have no difficulty discriminating between the /ja/ and /jja/ phonemes

- Adults cannot do so, which suggests there may be some developmental basis for phoneme discrimination influenced early in life
- Tested infants are pre-verbal
- Janet Werker used the head-turn procedure to indirectly measure the perception of phonemes
- Infant turns head toward speakers when a new sound is heard
- Ability is nearly lost by ten to twelve months old

Accents

- **Canadian Raising:** The phonetic phenomena that characterizes a typical Canadian accent.
- Shaped by the location and dominant speech patterns in the environment in which an individual is raised
- Brain injuries (ex. Stroke) can cause accents to develop
- **Foreign Accent Syndrome:** Following severe brain injuries, the individual will sound as though they're speaking their native language with a novel, acquired foreign accent.
 - o Sound as though they alternate between a variety of accents, rather than a single one
 - o Results because the patient is adopting various rhythms that facilitates speech and happen to resemble a family of accents
- Injury to Broca's Area suggest that part of the problem may be in speech production
- Injury to the cerebellum affects motor coordination, which can affect the individual's ability to pronounce the phonemes specific to his native language

Social Learning Theory: Children learn language through a combination of imitation and operant conditioning.

- Ex. Baby is babbling and accidentally stumbles upon "mama"
- Mother will respond with praise, smiles, and attention, therefore providing reinforcement for the desired behaviour
- **[1] Evidence For Social Learning Theory**
- Promotes "nurture"
- Case of Genie
- Throughout Genie's childhood, she was locked in a small room and had no interaction with other people
- After she was rescued from an abusive situation at age thirteen, she had no language skills
- Indicates that without exposure to adequate sources of language, children will fail to develop language skills

- **[2] Evidence Against Social Learning Theory**
- Promotes “nature”
- Argues that children’s language development is too complex to be driven by imitation and reinforcement alone
- Once children have learned to produce words, they combine them in novel ways that have never been modeled before
- Children make language errors that would never be heard in adults:
 - Overextensions
 - Occurs when children apply a rule too broadly
 - Can occur at the level of meaning or syntax
 - Ex. Family pet (dog) named Doggie
 - Child begins to call all four-legged animals Doggie
 - Ex. Adding the suffix –ed to all words
 - Child says she “runned” instead of ran
 - Underextensions
 - Occurs when children apply a rule to a specific object only
 - Ex. Child only calls her pet Dog and doesn’t recognize the other dogs as dogs
- Noam Chomsky argues that language develops rapidly due to an innate mechanism
- **Language Acquisition Device (Innate Mechanism Theory):** Innate mechanism present only in humans, which helps language develop rapidly according to universal rules.
- Ex. Deaf children from around the world were found to share the same sign language gestures without ever being taught
- Spontaneous signing did not necessarily match the grammar rules of their parents’ native language
- Neurological data show that very young infants show neurophysiological responses to the first language they’re exposed with
- Indicates that infants’ brains are pre-wired to adapt to the sounds and their associated meanings that are present in their environment
- Very young infants also prefer listening to speech rather than non-speech sounds
- Indicates an innate predisposition to expose themselves to language

Animal Communication

- Ex. The waggle dance by honey bees
 - Performed to communicate the location of food to the other bees
- Ex. Birds singing complex songs
 - Done for mate attraction and competition

- Differences between animal and human communication are best understood in experiments where researchers try to teach non-human animals to use human language
 - Ex. (Using CC) **Washoe**, a chimp raised by scientists and taught how to communicate using American Sign Language
 - Washoe learned to use signs to communicate simple requests and could combine them to communicate more complex requests
 - Washoe couldn't communicate using any systematic grammar
 - Ex. (Using CC) **Sarah**, a chimp raised in a lab setting and taught to use plastic symbols to communicate demands
 - Sarah learned to use many different symbols, showing evidence of a large vocabulary
 - Sarah couldn't combine them in novel combinations
 - Ex. **Kanzi**, a bonobo taught to communicate using a set of geometric figures known as lexigrams arranged on a keyboard
 - Instead of using CC, scientists utilized complete immersion in the language, hoping that Kanzi would learn the language by observation

Categories And Concepts

Introduction

- Two cognitive mechanisms: attention and memory
- Attention helps you to focus finite mental resources on key parts of the active scene
- Memory helps you recall specific behaviours, which are appropriate to your current needs

Categorization

- Without the cognitive ability to categorize, every sensory experience would be completely unique, thus making you unable to draw connections with the past and being forced to make unique decisions on even the most routine actions
- Ex. Bob wakes up with a headache and categorizes the situation in "hangovers"
- With previous experience, he concludes that his current condition is best treated with lots of water and quietness

Functions Of Categorization

- **[1] Classification**

- Allows you to treat objects that appear differently as belonging together
- Ex. Green, red, and yellow apples appear different on a colour dimension, but by classifying them as apples, you can treat them similarly and assume they're safe to eat
- **[2] Understanding**
- **[3] Predicting**
- Categorizing the current event experience and comparing it to similar experiences in memory
- **[4] Communication**
- Many words in our language refer to some type of category or concept and using the category name allows for efficient communication

Illusion Of The Expert: Feeling that something must be simple because you're so good at it.

- Susceptible to this when dealing with simple categories

Rules

- When asked to define rules, you may find it difficult to properly exclude and include items for category membership
- When given a test stimulus, you can easily decide membership
- Suggests that humans have an internal representation of categories that's independent of the rule we try to define

Prototype: An internal representation of the category.

- Ex. A prototype of cars would be one single representation of a car
- Thought to be the average or best member of a category
- Formed through experience and can be very personal
- All the objects you've previously encountered are averaged together
- Experiment: evidence supporting this theory from a classic study of robins and penguins
 - o Subjects were asked to verify if the statement was true or not
 - o Subjects responded significantly slower when they were asked if the penguin was a bird or not
- Suggests that more typical category members, which are likely closer to the prototype, are categorized more quickly/easily

Prototype Theory: Suggests that we categorize objects by comparing them to a prototype.

Exemplar: A stored memory representation.

- Ex. In the category of cars, there is one exemplar for every car you see
- There are multiple representations for each category

Exemplar Theory: Suggests that we store our entire lifetime worth of experiences.

- Quickly search through your library of exemplars to compare to the current object
- Identifies current object as a member of the same category if there's sufficient similarity in the exemplar and object
- Provides a more compelling account of human categorization abilities

Children And Categories

- Children as young as three are able to understand general categories
- Ex. Teach Bob a new fact about his pet dog, he can generalize that new fact to different dogs
- Children are able to understand innate properties of a given category (ex. Child understands that you can change the nature of a machine, but not the nature of an animal)

Conclusion

- We don't fully understand how adult/child categorization proceeds
- We know what children can and cannot do at particular ages
- This information helps us understand how categorization functions throughout the lifespan

Animal Categorization

- Scientists have taught baboons to categorize objects as being food or non-food
- Baboons could also identify whether or not two objects were the same or different

Attention

- Allows you to navigate through a crowded world brimming with information/distraction
- Ex. Crossing a busy street requires the ability to focus attention on more than just crossing a busy street intersection
- Without the ability to focus limited processing resources, it wouldn't be possible to enjoy a piece of music, understand a joke, or learn new things
- Phenomenon → Model → Hypothesis
 - o Psychologists need to operationally define the problem to build cognitive models and design experiments with testable hypotheses
- William James

- Defined attention as, “It is the taking possession by the mind in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thought... It implies withdrawal from some things in order to deal effectively with others, and is a condition which has a real opposite in the confused, dazed, and scatterbrained state.”

Concept Of Selection

- Attending to something causes the object of attention to be selected apart from the rest of the unattended objects
 - Ex. Noting the softness of the shirt’s fabric in the morning
 - No longer aware of the sensation later on during the day
 - Sensations fade into the background noise of stimuli competing for attention
- Some stimuli automatically trigger your attention
 - Ex. Light flashing in your peripheral vision
- The conscious ability to attend to the information that is relevant to our goals
 - Ex. Trying to find a particular person you are stalking in a large crowd
 - Actively selecting where to focus the attention
- Irrelevant information in the environment can act as noise and make it difficult to identify and attend to important information
 - Ex. Looking for your stalking victim in a crowd versus walking leisurely by the beach
 - Ex. Driving through busy traffic becomes more difficult as you engage in an important call on your cell phone

Processes That Influence Attention

1. Automatic Processes

- a. Triggered involuntarily by external events
- b. Triggers the “capture” of attention
- c. Operate in a fast, efficient, and obligatory manner
- d. Ex. The notion of salience
- e. A salient piece of information appears to naturally pop out at you
- f. Certain cues are more noticeable and lead to stronger/quicker association when paired with events
- g. Ex. It’s hard to miss the loud sounds and flashing lights of a police car chasing Bob
- h. The information automatically captures your attention whether intentional or not
- i. Ex. Practicing a task will eventually lead to doing it with little to no effort

- j. Driving a car is a learned motor skill involving many steps (pedals, signaling, steering)
- 2. Controlled Processes
 - a. Guides attention voluntarily and consciously to objects of interest
 - b. Requires cognitive effort
 - c. Operate in a slow manner
 - d. Ex. Driving a car using flexible controlled processes involved in conscious attention as you choose when to make lane changes, speed up/down, change the radio station, etc.
 - e. Ex. Turning down the radio when looking for an address
 - f. Demonstrates that it's difficult to consciously attend to many aspects of the task-environment at the same time because the resources for controlled processes are limited
 - g. Performance in all tasks will suffer if adjustments are not made to the demand for attention

The Spotlight Model

- On stage, the spotlight illuminates a key part of the visual scene
- Similarly, according to Michael Posner, the attention spotlight focuses on only one part of the environment at a time
- Attention can be consciously directed across the visual scene (ex. Looking for a friend at a crowded after-party)
- Attention can be hijacked by unconscious processes that quickly grab attention (ex. Avoid oncoming speeding cars when stepping off the sidewalk)
- Objects within the spotlight are processed preferentially as they yield a faster reaction time and higher accuracy

Measuring Changes In Attention: Spatial Cueing Paradigm

- Fix attention to the middle box of three boxes
- At some point, a target will appear in either the left or right box
- Indicate the correct target location ASAP
- Before the target appears, a potential box briefly flashes
- Flashing box serves as cue for attention
- Target can follow in either the cued or the not cued location

Influence Of Flashing Cue On Target Detection Time

- **[1] Automatic Processing**

- Ex. The target appears randomly on either the left or right target box and is equally often cued or not cued
- The cue provides no predictive information about where the target will appear
- More likely to have a faster reaction time with an unreliable cue if the target appears in the same box
- Consider all the trials in which the target appears in the left box
- Target detection is quicker when it's correctly cued
- Experiment suggests difference in target detection is governed by automatic control of attention
- The relatively short time interval between cue and target presentation in this experiment favours automatic processes
- Cue automatically attracts the attention spotlight to the cued location
- Attention will amplify the perceptual processing of the target in the cued location
- If a target appears in a non-cued location, it'll be detected slower because the attention spotlight will have been directed away from the actual target location
- **[2] Controlled Processing**
- Ex. The attention cue provides accurate predictive information about where the target is likely occur
- Consciously controlled shifts of attention can lead to faster response to targets that appear in the location indicated by the cue

Auditory Attention: Filter Models

- Ex. Bob attends a fancy cocktail party and is surrounded by many different sounds competing for his attention
- Despite the noise, he is still able to single out the specific voice of his conversation partner
- Colin Cherry conducted experiments on the cocktail party effect in which subjects were asked to listen to two different messages played from a single loudspeaker at the same time
- Subjects tried to separate the messages
- Proved the ability to separate target sounds from background noise is based on physical characteristics (ex. Speaker's gender, pitch, speed)

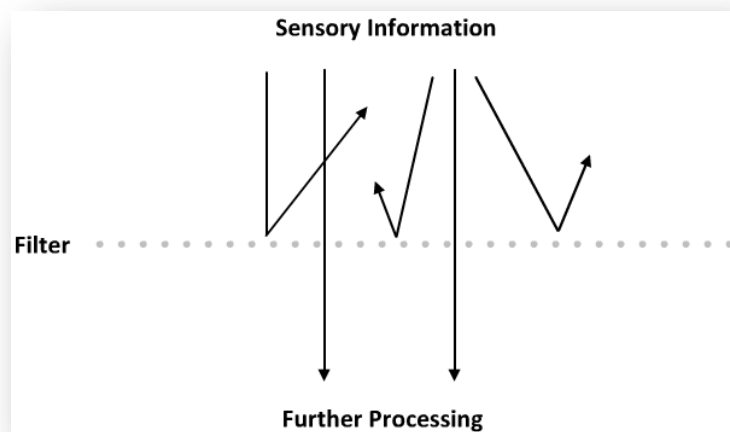
Filters And Attention

- Ex. A cognitive model comparing attention processes to a filter, which sifts away distractions and only allows important information through
- Information → Filter → Further Processing
- Ex. Examining a particular brown guy in a crowd of white men

- Filter and spotlight models propose different mechanisms for attention
- Spotlight model suggests that attention would enhance the processing of the single brown guy relative to the white men
- Spotlight = Focus on brown guy
- Filter model suggests that attention helps us ignore the white men and allows the brown guy to continue on for further processing
- Filter = Ignore white men

Broadbent's Single Filter Model

- In 1958, Donald Broadbent proposed the first filter model of attention
- Used data from behavioural experiments to infer the functional stages of cognitive processing
- Filter selects important information on the basis of physical characteristics and allows that information to continue on for further processing
- Information that doesn't pass through the early physical filter was assumed to be completely eliminated and unavailable for deeper analysis for meaning and semantic importance

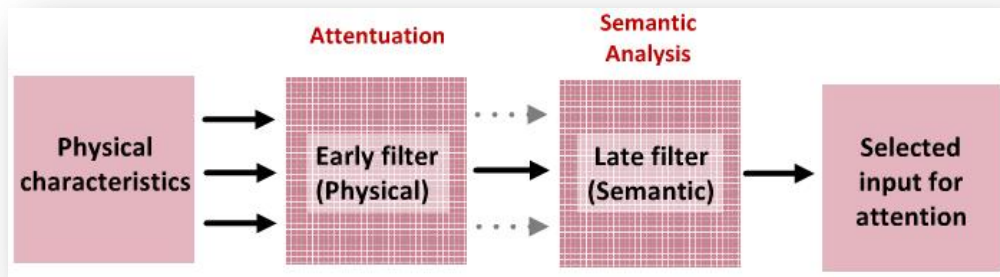


- Ex. Dichotic listening paradigm
- Bob puts on headphones and listens to a different message directed into each ear
- He is to shadow the message in the attended ear by repeating back the message
- If he is asked questions concerning the content of the attended message, he should have no problem
- If he is asked questions concerning the content of the unattended message, he should have processed almost no information

- **Limitation:** model assumes that there's absolutely no additional processing of unattended signals
- Experiment by Von Wright et al. suggests that in fact some information is processed in the unattended ear
- [1] Classical conditioning paradigm is used to associate a particular word with an electrical shock
 - o Bob is electrically shocked whenever he hears "Leafre"
- [2] Dichotic listening experiment sometimes play words with similar sound or meaning to the conditioned word
 - o When similar words are presented in the attended ear, they reacted with a conditional response
 - o When similar words are presented in the unattended ear, they also reacted with a conditional response

Triesman's Dual Filter Model

- **Breakthrough:** When participants are able to remember important information in the unattended stream.
 - o Common when the unattended information is highly relevant
 - o Ex. Bob is having a conversation with Jill at a MI meet-up
 - o Many distracting sounds that must be filtered out in order to focus on the conversation
 - o If someone happens to say Bob's name aloud in the crowd, this information is likely to break through and capture his attention
- Proposed two filters
- **[1] Physical**
 - o Information is first passed through
 - o Information is evaluated based on physical cues
 - o Physical filter weighs the importance of incoming stimuli based on these physical cues and passes along all the information to the semantic filter
- **[2] Semantic**
- Information is evaluated for meaning
- Takes into account the weights assigned by the physical filter
- Considers the deeper meaning and relevance of the stimuli
- Chooses which information to attend and discard
- Can override the physical filter by considering the meaning of particular information



The Stroop Task: Popular task in attention research first described in 1935.

- Paradigm designed to test the limits of the attention filter
- Participants are presented with a colour-word and asked to name its ink-colour
- **Congruent Items:** Contain matching word and colour dimensions (ex. The word “red” written in red).
- **Incongruent Items:** Contain mismatching word and colour dimensions (ex. The word “red” written in green).
- Researchers measure how long it takes participants to correctly identify the ink-colour while trying to ignore the word dimension
- Performance is faster for congruent items

The Stroop Effect: Occurs when performance is faster in a list of congruent colour-words when given a list of congruent colour-words and a list of incongruent colour-words.

- Requires you to attend to information on the task-relevant dimension and to ignore information on the task-irrelevant dimension
- Difference in performance between incongruent and congruent trials can serve as an empirical measure of processes involved in selective attention

Controlling The Stroop Effect

- **Proportion Congruent Manipulation:** Used when measuring conscious control over Stroop interference, which changes the ratio of congruent to incongruent trials.
- **[1] Increased Stroop Effect**
- High proportion congruent block of trials
- 75% congruent, 25% incongruent
- More “easy” trials
- Take advantage of the word dimension matching the ink-colour dimension and employ a conscious strategy to attend to the word dimension
- Strategy increases performance on congruent trials

- Strategy decreases performance on incongruent trials
- **[2] Decreased Stroop Effect**
- Low proportion congruent block of trials
- 75% incongruent, 25% congruent
- More “difficult” trials
- Actively try to ignore the word dimensions entirely because the word hardly ever provides the correct response

The Stroop Task: Automatic And Controlled

- Measures the influence of both automatic and controlled processes
- **[1] Automatic**
- **Evidence:** Word reading influences performance even when the word is to be ignored
- **[2] Controlled**
- **Evidence:** People can adopt consciously controlled word reading strategies that modulate The Stroop Effect

Visual Search Task: Subjects look for a target in an array of distractions.

- Designed to test how everyday attention is used
- Analogous to tasks performed everyday (ex. Looking for lost keys)
- Ex. 8x8 array of the letter “I” with one “T”
- Increase difficulty by increasing the number of items to search through (ex. 15x15 array)
- **Set Size:** The number of items to search through.
- **Set Size Effect:** Increase in difficulty as set size increases.

Feature And Conjunction Search

- **[1] Feature Search Tasks**
- Ex. Finding the letter “T” in an array of the letter “I”
- Single feature search task
- Look for one particular feature to identify the target (ex. The horizontal line that distinguishes a “T” from the “I”)
- **Pop-out Effect:** Visual search task that proceeds rapidly regardless of set size and is easily induced by colour.
- Ex. 15x15 array of the letter “I” in red with one “T” in green
- Colour is an easy feature to search for
- **[2] Conjunction Search Tasks**
- Identifying a target that is defined by two or more features
- Ex. 15x15 array of the letter “I” in red and green and the letter “T” in red with only one “T” in green

Contextual Cueing

- The context of the search task serves as a cue to make searching more efficient
- Ex. Bob cannot find his Nexon game cards, but knows he usually keeps it in his left drawers
- Bob begins the search in his left drawers
- As a result, he finds them quicker

Importance Of Attention

- Attention errors lead to everyday inconveniences
- Ex. Forgetting to put the milk in the fridge
- Chronic attention errors play a role in psychological problems
- Ex. ADHD, anxiety insomnia, OCD

Memory

Common Memory Metaphors

- Memory acts like a video camera, which accurately preserves image and audio to be played back at a later date
- Memory acts like a filing cabinet, which stores memory files in an organized folder system and can be accessed to recall something
- Memory acts like a computer, which has specialized components responsible for handling different memories at different times

Frederic Bartlett

- Metaphors are useful, but misleading
- Metaphors are assuming memory can store experiences in their original, undistorted form
- Metaphors are assuming memory retrieval is as simple as accessing a previously stored item that has been kept in a specific place
- **[1] Data**
- Stored data is identical to inputted information
- Retrieved data is identical to inputted information
- **[2] Memory**
- Stored memory includes personal details and interpretations
- Retrieved memory may be altered or lost

Testable Hypotheses About Memory

- Questions about memory acquisition
 - o What'll be stored in memory?
- Questions about memory storage
 - o Where'll it be stored?
- Questions about memory retrieval
 - o How can memories be returned to consciousness?

Importance Of Cues

- One memory triggers another, shaping the flow of the conversation
- Ex. Bob tells a funny anecdote about KSing noobs and Jill is reminded of when she KS'd someone as well
- Early researchers of memory were heavily influenced by the behaviourists
- Early focus of memory research concerned how cues interact with encoding and retrieval mechanisms of memory

Testing Hypotheses

- Psychologists rely on cognitive models to understand a complex cognitive function like memory
- Models describe and organize data
- Models make specific, testable predictions that can be studied in controlled experiments in the lab

Basic Memory Task

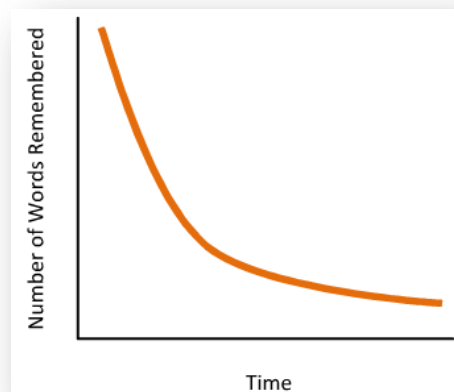
- **[1] Encoding Phase**
- Subject learns a list of items, words, or pictures
- Ex. Researcher presents the same list of items to two different groups
- Experimental group is asked to learn the presented items
- Control group is distracted
- **[2] Retrieval Phase**
- Subjects are tested for their memory of the items presented in the encoding phase

Recall Test: Subject is asked to freely generate as many items as she can remember.

Recognition Test: Subject is shown several items and asked to judge whether each item is new, meaning it was not presented during the encoding phase, or old, meaning it was presented during the encoding phase.

Hermann Ebbinghaus

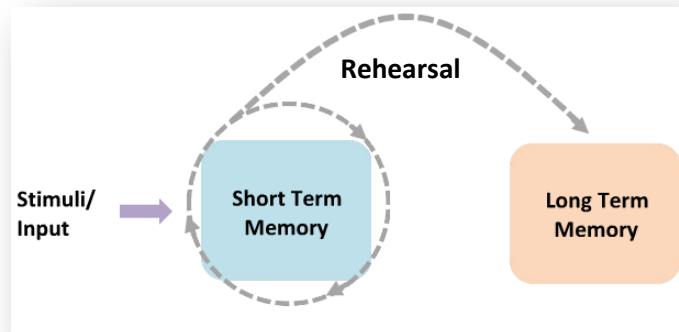
- Operationally defined memory as a serial learning task
- He memorized word lists and suggested each word in the list served as a cue that triggered the memory of the following word
- Used the basic encoding and retrieval design to learn about cueing and forgetting of memories
- Ex. He memorized nonsense words during the encoding phase and later tested his recall ability during the retrieval phase
- Used nonsense words to minimize the influence of his prior experience on his test results
- Discovered his ability to recall words was highest immediately following learning and that over time he remembered fewer words
- **Forgetting Curve:** Constructed by Ebbinghaus and describes the increasing rate of memory failure over time.



The Multi-Store Model

- In 1968, proposed by Atkinson and Shiffrin
- Assumes that memory is composed of both short and long-term storage systems
- Short-term memory buffer operates similar to RAM on a computer
- Long-term memory operates similar to saving files onto the hard drive of a computer
- **[1]** Incoming perceptual information is first stored in a short-term memory buffer
- Information in short-term memory is available for online tasks but isn't stored permanently
- **[2]** Important information encoded in short-term memory can be transferred to the long-term memory storage system for more permanent, long-term storage

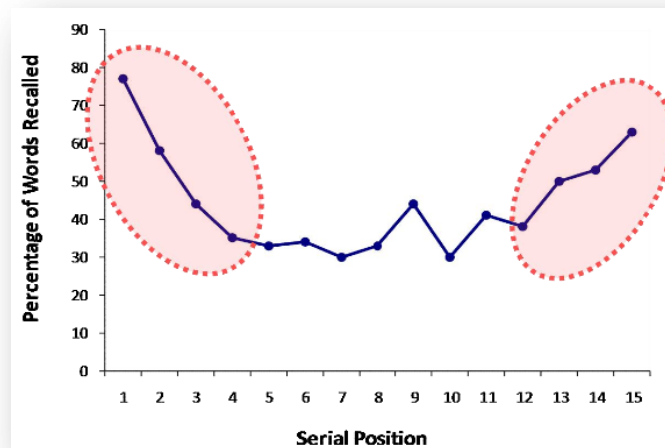
- Ex. Items in short-term memory are rehearsed and then transferred into the long-term memory storage system



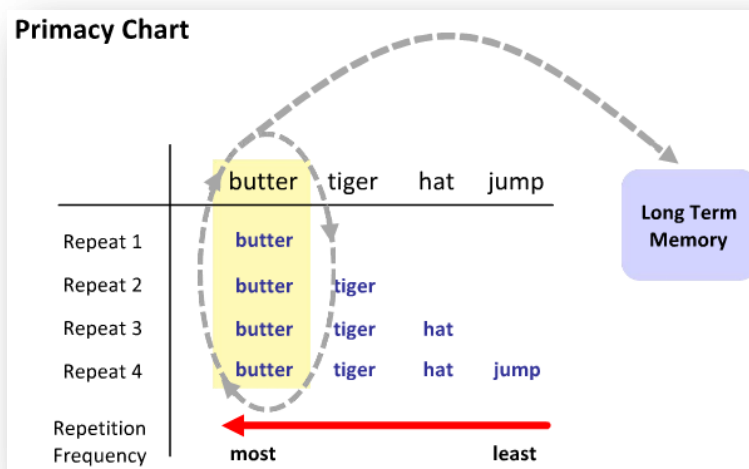
Short-Term Memory Capacity

- Demonstrated by George Miller to usually be 7 (+/- 2) items
- Demand on short-term memory becomes strained when asked to memorize 7+ items
- If rehearsal stops, the short-term memory can fade
- **Chunking:** Re-organize information into meaningful packets, which allows more information to be held in short-term memory.
- Ex. List II is easier to memorize
- List I: JGTLXYKAOGHQCVPPT
- List II: CBCFBICIARSVPIBM
- Both lists contain sixteen letters, but the letters in the second list can be chunked into five bits of information forming similar letter groupings
- Letter grouping can pack a lot of information
- Ex. Remembering seven random letters of the alphabet versus seven animal names

Serial Position Curve



- Typical results from a recall test during the retrieval phase
- Memory performance is best for items early or later in the list
- **Primacy Effect:** Memory performance is good for items encoded early in the list.
- Driven by rehearsing items into the LTM
- According to the multi-store model, items at the beginning of the list will be first to enter STM, thus have the most opportunity to be rehearsed
- Ex. Memorize the list, “butter, tiger, hat, jump”
- Memorize by repeating in sequential order
- Stimuli/input goes into STM, and goes into a process of rehearsal
- First item will be the most rehearsed and has the best chance of being transferred into LTM for permanent storage



- Items in the middle have less opportunity for rehearsal and a lower chance of being transferred into LTM
- **Recency Effect:** Memory performance is good for items encoded later in the list.
- Driven by items remaining active in the STM buffer
- According to the multi-store model, all encoded information is first sent to the STM buffer that is limited to hold ~7 items
- Newest items replace the oldest items in the STM buffer
- At the end of a list, the last seven items are not replaced and will remain in STM

Improving Primacy

- Primacy effect is influenced by manipulating a subject's ability to rehearse items
- Ex. Manipulating the presentation time of each to-be-remembered item
- More time to encode each item would allow more time for rehearsing those items into LTM
- Primacy effect is enhanced for a list of items given with a long interval of presentation relative to a list of items given with a short interval of presentation
- Increasing time between item presentation increases:
 - o Amount of times each item can be repeated
 - o Probability of item being stored in LTM
 - o Performance recalling first couple of items

Diminishing Recency

- Recency effect is influenced by manipulating the contents of the STM store
- Ex. Manipulation that causes the most recent contents of the STM to be replaced or disrupted
- Subject is asked to perform a distracting task immediately following the encoding phase
- Performing the distracting task requires STM resources
- Ex. Three groups of subjects are asked to memorize a list
- Group I: Recall after performing different task for 30s
 - o Recency effect diminished
- Group II: Recall after silent interval for 30s
 - o Recency effect present
- Group III: Recall immediately
 - o Recency effect present

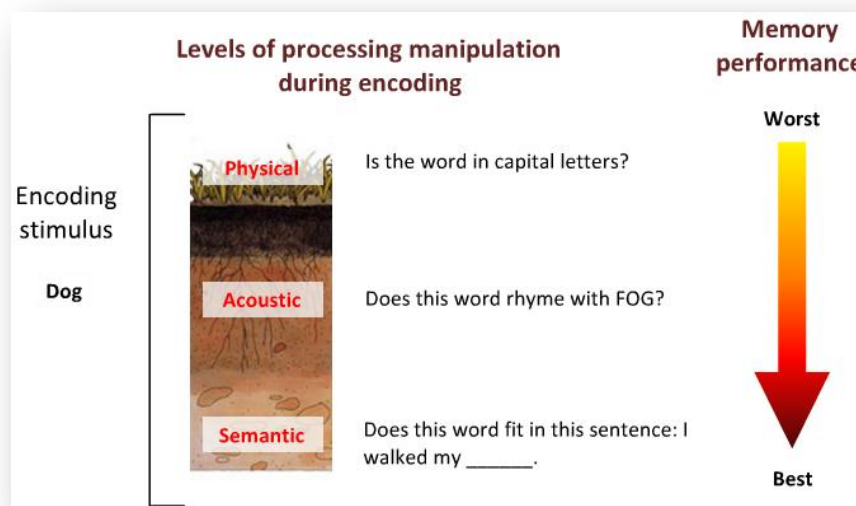
Levels Of Processing

- Memory performance depends on the level at which items are encoded
- **[1] Shallow Level**

- Encode physical characteristics
- Encoding requires little effort
- Poor memory performance
- **[2] Deeper Level**
- Encode semantic characteristics
- Encoding requires significant effort
- Better memory performance

Craik And Lockhart

- Tested the levels of processing model by directly manipulating the level at which a subject encoded a list of words
- Ex. Subjects were presented with words that could be judged on different properties
- Shallow encoding condition made physical judgments
- Moderate encoding condition made acoustic judgments
- Deep encoding condition made semantic judgments



Levels Of Processing Principle: The more you actively organize and understand material to be learned, the better you will be able to remember it and paying attention to only surface details leads to poorer recall.

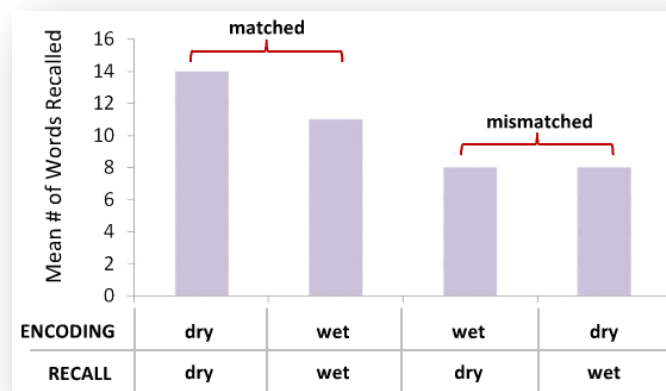
- Shallow levels of processing: Passively skimming through a reading, taking verbatim notes
- Deep levels of processing: Actively reading, note-taking by making connections with existing knowledge base

Encoding Specificity

- In a lab, researchers purposely use simplified memory tasks, which allow variables to be controlled and manipulated
- In the real world, memories are not restricted to learning lists of items, but are rich, detailed, and experienced in the context of the world around you
- Environmental cues are incorporated into your memories along with learned items
- **Principle Of Encoding Specificity:** Memory encodes all aspects of specific experiences.
 - Ex. When encoding a word in a memory experiment, all of the specific aspects of that experience including properties of the room you're in, the chair you're sitting on, the font type you're looking at, etc.
 - All of these specific aspects of the experience can influence memory performance in the future by acting as specific cues for the event/item being recalled

Godden And Baddelley

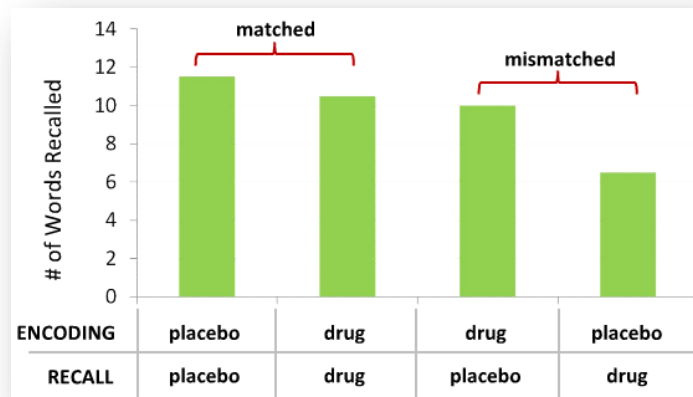
- Tested the environmental influence on memory performance
- Ex. Scuba divers encoded a list of words on land or under water
- Follow-up recall test was done in the same or different encoding context
- Subjects were better able to remember items from the list when they were in the same context during the memory test
- Concludes that memory performance depends on how items are encoded and the encoding context



Eich et al.

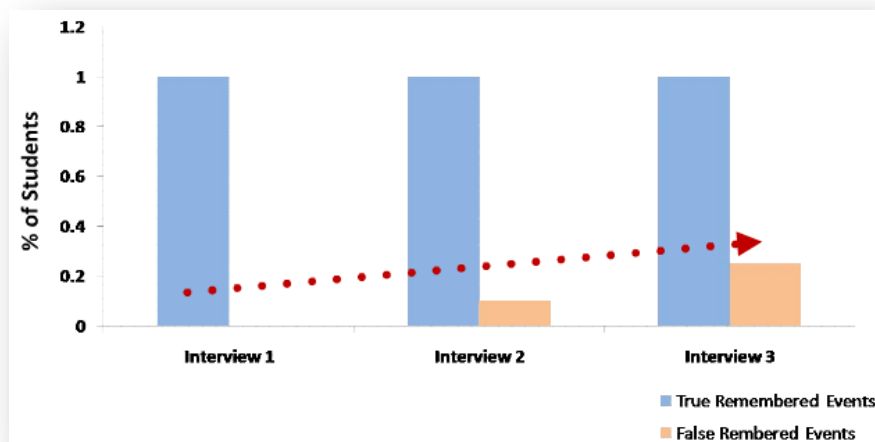
- Tested the influence on memory ability by the internal state of a subject

- Ex. Subjects under the influence of drugs while attempting to encode a list of items
- One group of subjects blazed while encoding
- Another group of subjects received a placebo while encoding
- Follow-up recall test was done in the same or different internal state
- Concludes that memory performance depends on the match in subjects internal states between encoding and recall test



Elizabeth Loftus

- Researches the extent to which false memories can be implanted by suggestion
- Ex. Asked subjects to remember a list of childhood experiences that were obtained from their parents
- $\frac{3}{4}$ experiences were real, $\frac{1}{4}$ experience was fake
- Subjects were asked to recall and describe these four experiences over a period of three days
- By the third day, 20% of people believed a fake experience happened in their past
- False memories demonstrate that memory is high constructive



False Memory Implantation

- **[1] Plausible Memories**
- Ex. Getting lost in a mall
- **[2] Bizarre Memories**
- Ex. Being raised by penguins
- Seamon et al. demonstrated that repeatedly imagining an event can lead to the formation of false memories, even for bizarre situations
- Ex. Subjects visited various locations on a university campus
- At each stop a familiar or bizarre action was either performed or imagined
 - o Subject stopped at a pop machine was told to look for change
 - o Subject stopped at a pop machine was told to imagine praying
- Follow-up recall test two weeks later showed subjects believed to have performed the bizarre action

Memory

- False Memories
 - o Provide support for the idea that memory is a reconstructive process
 - o Recalling a memory is open to interpretation and suggestion
- Fluency-based Memory Illusions
 - o **Fluency:** The ease with which an experience is processed, some easier (more fluent) than others.
 - o Ex. Sense of familiarity when looking at a stranger

- Familiar experiences are generally processed more fluently than are novel experiences
- **Attributional View**
 - **Attribution:** Judgment trying together causes with effects.
 - To make an attribution on the basis of processing fluency, we're making a judgment that identifies a cause/source to the feeling of the processing fluency
 - Ex. Make many different kinds of attribution when having a feeling of processing fluency about a stranger
 - Maybe I know him from work?
 - Maybe his unconventional glasses caught my attention?

Experiment: Become Famous Overnight

- Memory illusions can be created by manipulating how people interpret their feelings of fluency
- Ex. Subjects are asked to read a list of names in phase I
- Group A had a 24-hr delay before phase II
- Group B had no delay before phase II
- Subjects were given a fame rating task in phase II
- List included famous celebrities, not-so-famous celebrities, and non-famous fictional names
 - Some non-famous fictional names were novel and some were from phase I
- **Group A:**
 - Appropriately rated the famous celebrities and not-so-famous celebrities
 - Rated the non-famous fictional names from phase I as being more famous than the novel non-famous fictional names
 - **False Fame Effect:** Illusion produced in which a name is believed to be famous because it was previously seen.
- Subjects experienced a feeling of processing fluency in phase II when non-famous fictional names from phase I were encountered
- Group A produced a false fame effect because the feelings of fluency for the non-famous fictional names from phase I were improperly attributed to fame
- Mistakenly attributed fluent processing of the name to the person's fame and not to the fact that this name was read a day earlier
- **Group B:**

- Appropriately rated the famous celebrities, not-so-famous celebrities, and non-famous fictional names
- Subjects experienced a feeling of processing fluency in phase II when non-famous fictional names from phase I were encountered
- Group B didn't produce a false fame effect because the feelings of fluency for the non-famous fictional names from phase I were properly attributed to the fact that they just read those names moments ago

Bartlett

- Proposed that memories are constructed when required to remember something
- Implied that memories don't exist until the present situation requires that we construct a memory
- The memory system is a pile of basic building blocks using the raw materials of perception and experience
- Idea of "true objective" memories is inexact because memory is often subject to interpretation/reconstruction

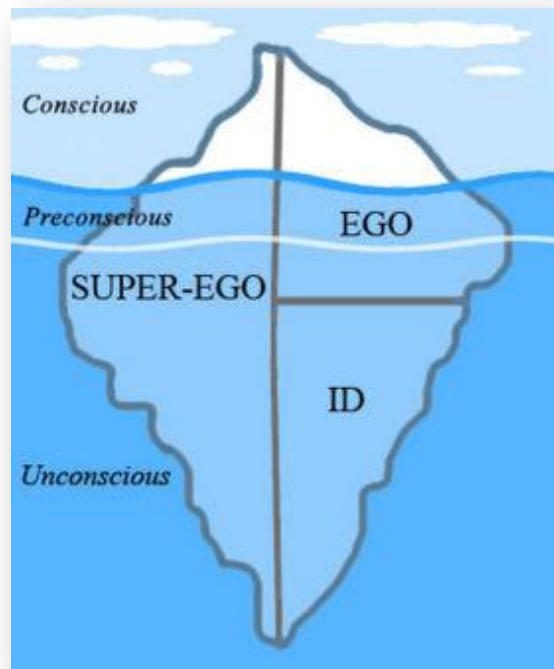
Personality 1 And Personality 2

- Ex. Shy, considerate, talkative, practical, traditional
- Personality has no physical existence
- Personality is an idea, an abstract concept used to express or capture something important about our experiences
- Abstract concepts referred to as "hypothetical constructs" help organize/understand experiences
 - o Ex. Personality, memory, gravity, energy

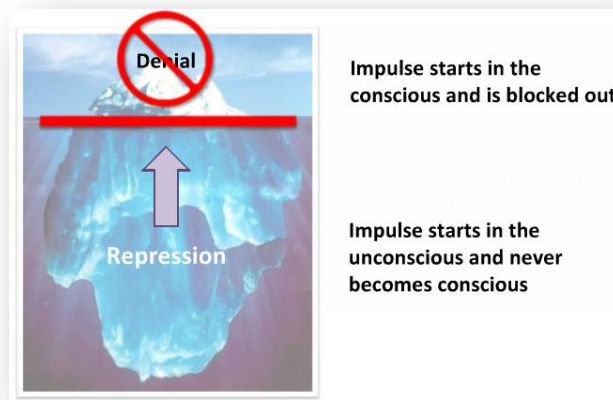
Approaches To Personality

- **[1] Type Approach**
- Assumes there are a small number of distinct personality types
- Dominant in Western thinking until the 16th and 17th centuries
- Proposed by Hippocrates
- Believed the human body was made of four "humours"
 - o Blood
 - o Phlegm

- Yellow bile
- Black bile
- Believed personality was determined by the balance of these four “humours”
- Ex. Someone with a melancholic personality type is often sad and wistful
 - Melan: black
 - Cholic: bile
- **[2] Psychodynamic Approach**
- Personality is generated by internal psychic structures or processes
- Many of these structures are unconscious, thus people are unaware of many important aspects to their personality
- Pioneered by Sigmund Freud
- **Freud’s Tripartite Model Of Personality**
- Ex. Bob’s friends are all gaming at a LAN party and he wants to join, but he has a group assignment to do
- Three personality structures:
 - **[1] Id (Libido)**
 - Source of one’s basic instincts and motivational energy
 - **Pleasure Principle:** Seek pleasure and avoid pain (ex. Seek out water, food, air, sex).
 - Selfish, impatient
 - Ex. He can feel the arrow-key spamming at his fingertips
 - Motivated to seek out the pleasure associated with gaming instead of doing work
 - **[2] Ego**
 - Serves as a mediator between the id and the superego
 - Aware of the outside reality
 - Ex. Working on the group assignment and then meeting his friends at the LAN party
 - **[3] Superego**
 - Source of one’s moral principles
 - Obeying rules and respecting values
 - Occurs around age five or six and is established through parental control and self-control
 - Ex. Getting the group assignment done



- **Defense Mechanisms**
- Id impulse is immoral → Conscious ego feels moral anxiety
- Id impulse is dangerous → Conscious ego feels neurotic anxiety
- Conscious ego is protected against anxiety by defense mechanisms created by the unconscious ego
- **Repression:** Unconscious ego blocks id impulses from ever reaching consciousness.
 - Simplest defense mechanism
 - Repressed impulses continue to press for entry into consciousness
 - Keeping them out takes a lot of the ego's available energy
 - Information can sometimes slip through defense into consciousness
- **Freudian Slips:** Repressed impulses that sneak into consciousness as slips of the tongue or symbolically disguised as dream images.
- **Denial:** Conscious ego engaged in an activity, but the unconscious ego prevents any memory of the event.
 - Conscious ego feels no anxiety despite having done something dangerous or immoral because there is no memory of the behaviour
 - Anxiety-producing behaviour begins in the conscious ego after a behaviour has already occurred

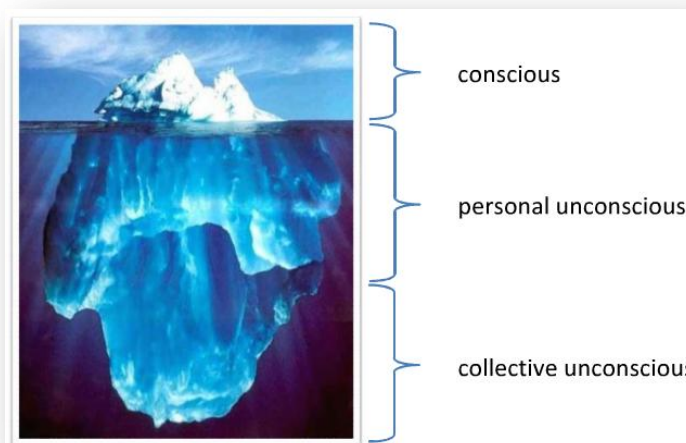


- **Rationalization:** Unconscious ego justifies some conscious action.
 - Sometimes used if an impulse cannot be repressed or denied
 - Conscious ego has done something dangerous or immoral
 - Unconscious ego floods consciousness with plausible, non-threatening reasons for the behaviour
 - No anxiety is experienced because the conscious ego believes that it has engaged in the behaviour for harmless reasons
 - Ex. Bob is involved in a traffic accident and an argument turns into a brawl, but he justifies himself with the excuse of self-defense
 - Aggression generated from id conflicts with belief that violence is wrong from superego
- **Projection:** Anxiety-producing thoughts are attributed to someone else.
 - Ex. Bob doesn't like Jill, but he's not sure why and feels guilty
 - Bob projects his feelings on Jill and convinces himself that it's really her who doesn't like him
- **Reaction Formation:** Conscious ego is filled with opposite ideas and feelings.
 - Ideas and feelings are opposite to actual impulses
 - Ex. Bob has a strong attraction to Jill, which causes him anxiety because the feeling isn't mutual
 - Bob deals with this consciously by outwardly feeling dislike and disapproval for her
- **Displacement:** Unconscious ego redirects forbidden impulses away from its original target to consciously acceptable targets.
 - Ex. Bob doesn't like his supervisor at work and feels aggressive towards him
 - However, it'd be inappropriate to act on this aggression, thus he ends up arguing with Jill

- **Sublimation:** A special type of displacement in which sexual/aggressive impulses are displaced to objects/activities that are socially acceptable.
 - Freud believed so-called “higher” activities are due to sublimated id, such as sports, painting, sculpting, literature, and science
 - Rational and emotion-free enterprise is ultimately derived from sexual/aggressive impulses
- **Freud’s Personality Development: Psychosexual Stages**
- Covers birth to puberty, where the fundamental features of personality have been shaped and remain the same throughout adulthood
- Psychosexual stages are defined by the dominant erogenous zone from which the child gets the most sexual/aggressive gratification
- During each stage, the child’s pleasure is obtained from primarily a single erogenous zone
- **[1] Oral Stage (Birth → 1 year)**
- First erogenous zone is the mouth
- Child discovers the pleasures of sucking and swallowing, and later of biting and chewing
- First objects associated with oral pleasure are the bottle, the mother’s breast, and one’s own thumb
- Pleasure from oral activities continues throughout a lifetime
- **[2] Anal Stage (1 year → 3 years)**
- Second erogenous zone is the anal area
- Child discovers the pleasures of excreting feces through bowel movements, and later of retaining feces when potty training is introduced
- **[3] Phallic Stage (3 years → 6 years)**
- Most important stage
- Third erogenous zone is the phallic area
- Child discovers the pleasures of stimulating the phallic area
- Oedipus and Electra Complexes generate intense anxiety
- Most memories of the child’s sexual/aggressive impulses toward mom and dad are blocked from consciousness through repression
- Boys go through the Oedipus Complex
 - Ego invests sexual id to his mother and wants to possess her for himself
 - Boy wants to get rid of his dad because he’s an obstacle to his exclusive possession of mom
 - Boy observes that girls don’t have penises and becomes convinced that his dad will retaliate against him by castrating him
- Boys resolve their dilemma by identifying with their fathers

- **Identification:** The process of becoming psychologically like the father and superego is formed from the father's beliefs and values.
- Girls go through the Electra Complex
 - Ego invests sexual id to her mother and wants to possess her for herself
 - Girl observes that some people don't have penises, including herself
 - Girl blames her mother for the perceived loss and experience a strong desire to regain a penis
 - Penis envy leads her to direct her sexual desires towards her dad
 - Girl wants to get rid of her dad because she's a "penis thief" and obstacle to her exclusive possession of dad
- Girls resolve their dilemma by identifying with their mothers
- **[4] Latency Stage (6 years → Puberty)**
- Child enters a period of relative sexual quiescence
- Id is channeled into behaviours that aren't yet overtly sexual
- **[5] Genital Stage (Puberty +)**
- Child experiences a surge of hormones, which produces a new wave of id
- Specific direction of sexual interests/urges depend on where the id was directed as it was passed through the stages of childhood sexuality and what was done with the id that was withdrawn from mom and dad
- **Phenomena Of Fixation**
 - **Fixation:** Libido is attached to a specific erogenous zone at each stage and some excess libido can be left behind at a specific stage.
 - Ex. Fixation at the oral stage
 - Excess libido might be directed toward eating, smoking, or nail-biting
 - Ex. Fixation at the anal stage
 - **[1] Anal Expulsive**
 - Children who have fixated on pleasure from excreting feces
 - As adults, they may become messy and disorganized, and experience pleasure from giving things to others
 - **[2] Anal Retentive**
 - Children who have fixated on pleasure from retaining feces
 - As adults, they may have become overly neat and orderly, but stingy, stubborn, and rigid
- **Anna Freud**
 - Freud's youngest daughter expanded on his work by developing the role of the ego
 - Partially developed the defense mechanisms

- Developed a system of diagnosis that allowed therapists to distinguish between less serious childhood problems and more serious disturbances
- **Erik Erikson**
 - Expanded on the research of the ego
 - Emphasized the ego's positive and adaptive effects on development
 - Stressed social aspects of development
 - Stressed ego strengths, which are strengths gained by the ego when each stage of development is resolved
 - Re-termed psychosexual stages to psychosocial stages
 - Stages span throughout a lifetime
 - Trust/mistrust stage was equivalent to Freud's oral stage
 - Emphasized the conflict children face when they're highly dependent, but have limited communication capacities
 - Ego strength that emerges from the resolution of this conflict is hope
- **Carl Jung**
- Freud's student who disagreed with him
- Believed motivation to be provided by the libido
- Drives in libido are for more than sex and aggression
- Libido is not sexual energy, but a general life-enhancing energy that can be directed toward meeting different needs at different times throughout a lifetime
- Proposed a different psychic structure for the mind
 - Ego is central to our conscious mind
 - Unconscious psyche is divided into a personal unconscious and a collective unconscious



- **Collective Unconscious:** An ancient part of the human mind that forms the biological basis of human nature.
 - Same in everyone
 - Contents cannot enter consciousness
 - **Archetypes:** Libido contained in the collective unconscious in the form of basic human instincts.
 - Archetypes in the collective unconscious guide society's perceptions/beliefs
 - **Jungian Archetypes:** Assumed that these common themes, characters, and ideas about life and the world among dozens of cultures reflected the projection of universal archetypes.
 - Birth
 - Separation
 - The Hero
 - The Wise Old Man
 - Disaster
- **Personal Unconscious:** Repository of thoughts, memories, and emotions that were once conscious, but have been repressed into unconsciousness.
 - Different in everyone
 - Contents can be brought back into consciousness and into the ego by recalling events in the past
 - **Complexes:** Collections of images, memories, and feelings connected by a common theme.
 - The themes of these complexes are underlying archetypes
 - Uses up libido thinking about complexes
 - Ex. Jung had a mother complex
 - He spent a lot of psychological energy on ideas, feelings, and behaviours related to his mother
 - Collection of complexes that an individual holds help to make up their personality
 - **Special Complexes:** Some complexes reflect archetypes and are possessed by everyone.
 - **Persona**
 - Related to Freud's superego since it represents social values
 - Archetype
 - Instinct for social conformity
 - Need to be with others and to please them
 - Complex
 - Public self

- Feelings, thoughts, and impulses that are presented to others because they're believed to be approved
- **Animus And Anima**
- Archetype (Animus)
- Every woman's instinctive image of maleness
- Archetype (Anima)
- Every male's instinctive image of femaleness
- Complex (Animus)
- Feelings and thoughts rejected from consciousness because they're masculine
- Complex (Anima)
- Feelings and thoughts rejected from consciousness because they're feminine
- **The Shadow**
- Archetype
- Instinct for sexuality and aggression, also can be a source of energy, vitality, creativity, and intuition
- Complex
- The things about ourselves (ex. Emotions, impulses) that we totally reject
- **The Self**
- Archetype
- Instinctive desire for unity, balance, integration, and wholeness
- Projected through our affinity for circles and symmetrical shapes
- Role
- Integrate conflicting complexes
- Ex. Reconcile the shadow with the persona
- **Self-actualization:** When all rejected complexes are discovered and allowed to function with the other complexes.
 - Highest goal in personality development
 - Doesn't typically begin until middle age
 - Rarely occurs
- **Ego:** The conscious mind.
 - Selects perceptions, thoughts, and feelings from the personal unconscious and lets them enter consciousness
 - Helps to establish a sense of stability in our perceptions of ourselves and of the world
- **[3] Humanistic Approach**
- Considered most optimistic

- Focuses on human interests, values, strengths, and virtues
- There is an ideal developmental goal
- Advancements and set-backs are experienced
- Not limited by one's past (Ex. Having the potential to fully develop ideal personality characteristics despite experiencing a hardship during childhood)
- **Pyramid Of Abraham Maslow's Hierarchy Of Needs**
- Proposed a hierarchy of steps that must be satisfied in order to develop a healthy, ideal personality
 - Physiological
 - Bottom rung of the hierarchy
 - Focuses on the most basic and essential needs
 - Ex. Food, water, air
 - Safety
 - Focuses on a safe place to live with some stability and security
 - Having some form of income
 - Neurotic/insecure adults are stuck at this level
 - Love And Belongingness
 - Focuses on the need to bond and relate with others
 - Ex. Forming close friendships and romantic relationships
 - Individuals who don't fulfill this need are emotionally maladjusted
 - Esteem
 - Focuses on two forms of esteem:
 - Self-esteem, which is feelings of self-worth and respect for oneself
 - Esteem of others expressed via social status and recognition
 - Self-actualization
 - Top rung of the hierarchy
 - Focuses on maximizing personal abilities and strengths
 - Being able to identify one's strengths and weaknesses
 - Rarely occurs
- **[4] Trait Approach**
- Focuses on a set of characteristics that define an individual's personality
- Established by the work of Gordon Allport and Raymond Cattell
- Everyone possesses various personality traits
- **Personality Traits:** Predispositions to behave and react in similar ways in response to a variety of stimuli.
 - Can be expressed at different levels by different people
 - Considered to be on a continuum and can be thought of as a % (ex. On a given personality trait, some people may be at 100%, while others are below 50%)

- Ex. Someone who refuses to donate money to charities, doesn't leave tips for servers, and avoids buying gifts for others is said to be cheap
- These characteristics define one specific personality trait
- **Factor Analysis:** A statistical method used by Cattell that creates broad personality factors, which are groupings of numerous related characteristics.
 - Reduced personality characteristics to sixteen general personality factors
 - Warmth, reasoning, emotional stability, dominance, liveliness, rule-consciousness, social boldness, sensitivity, vigilance, abstractedness, privateness, apprehension, openness to change, self-reliance, perfectionism, tension
 - Criticized for having too many factors
- **Hans Eysenck**
 - Proposed a three factor model using similar factor analysis methods
 - Extraversion, neuroticism, psychoticism
 - Criticized for having too little factors
- **Robert McCrae And Paul Costa**
 - Proposed a five factor model
 - **The Big Five:** Most commonly accepted groupings of personality traits.
 - Openness, conscientiousness, extraversion, agreeableness, neuroticism
 - Factors have been replicated in many different samples, cultures, and languages
 - **Openness [to experience]**
 - Reflects a desire for new, exciting, and adventurous experiences instead of constantly repeating the same experiences
 - People high in openness tend to be intellectually curious, inquisitive, imaginative, unconventional and enjoy/appreciate reading, art, and nature
 - **Conscientiousness**
 - Associated with a well-ordered life
 - People high in conscientiousness tend to be neat, organized, and highly moral/ethical
 - Ex. Always early for appointments
 - **Extraversion**
 - Associated with a desire and ease to engage in social interactions especially in large groups of people
 - People high in extraversion tend to be energetic, highly social, and strong leaders
 - **Agreeableness**
 - Reflects a preference for cooperation and trust
 - People high in agreeableness tend to be warm, caring, and polite
 - Ex. Role of caregiver

- **Neuroticism**
- Reflects a trait that is not socially desirable
- People high in neuroticism tend to be distressed, dependent on others, and overly sensitive
- Ex. Someone who requires a lot of emotional support and is very self-conscious
- **[5] Behaviourist Approach**
- Treats the mind as black box
- All that's known about someone is through their overt behaviour
- Behaviour = personality
- Not interested in psychic structures of the mind
- Not interested in finding particular traits
- **[6] Cognitive Approach**
- Thoughts are the important determiner of personality
- Way of thinking, interpretations of the world, and understanding of yourself affect how you feel/behave
- Thought patterns are central to personality and are the cause of overt behaviours

Psychopathology 1

Abnormality

- Varies between people, culture, time periods
- Clinicians use a fixed set of criteria:
- **[1] Deviance**
- Refers to having thoughts, emotions, and behaviours that fall far outside of the standards of what others are doing
- Includes those who fall below and above the standard of the group
- Doesn't include cultural practices of minority populations
- **[2] Distress**
- Refers to experiences of intense negative feelings
- Includes bipolar patients in the manic phase who often feel extremely elated
- Includes antisocial personality disorder patients who feel no remorse when causing harm to others
- **[3] Dysfunction**
- Refers to the inability to function properly in everyday life
- Behaviours are often described as maladaptive because they prevent an individual adapting well to their environment

- Doesn't include someone on a hunger strike
- **[4] Danger**
- Refers to danger to oneself or another
- Ex. Person who engages in violence toward others
- Doesn't include athletes who participate in extreme sports

Classifying Disorders

- **The Diagnostic And Statistical Manual (DSM):** Book that clinicians refer to for guidelines.
 - Provides standardized criteria to aid in the diagnosis of psychological disorders
 - [1] Categorizes and describes mental disorders so clinicians will have a common set of criteria for applying a diagnostic label to the symptoms of their patients
 - [2] Allows researchers to talk to each other about mental disorders using a common language
 - Outlines two general criteria that must be met before a clinician can make any diagnosis regarding mental health, regardless of the specific disorder in question
 - [1] Disordered behaviour must originate from within the person, rather than being a reaction to something in the environment
 - [2] Disordered behaviour must be involuntary and the symptoms being experienced are uncontrollable
 - Attempts to group together disorders that have similar sets of symptoms with the assumption that similarities suggest a common cause and that they can be similarly treated
 - Doesn't offer an explanation for the disorder or suggest treatment methods

Models Of Psychopathology

- Attempt to explain the causes of disorders and to help decide how to treat them
- **[1] Biological**
- Assumes that a psychological disorder result from malfunction in the brain
- Brain may malfunction because it's physically damaged or because there's abnormal chemical activity (ex. Genetics, nutrition, disease, stress)
- Treatment often relies on drug therapy (ex. Antidepressants that change the balance of neurotransmitters in the brain)
- Treatment for extreme cases include electroconvulsive shock or brain surgery
- **[2] Psychodynamic**
- Assumes that a psychological disorder result from malfunction in the brain

- Brain may malfunction due to mental conflict in the mind (ex. Unresolved childhood issues)
- Treatment must focus on therapy to cope with underlying stressors (ex. Psychoanalysis)
- **[3] Behavioural**
- Assumes psychological disorders are external, overt behaviour rather than an internal malfunction
- Disordered behaviours are established through classical and instrumental conditioning
- Contingencies, rewards, and punishments received for our actions influence our behaviours
- Treatment focuses on seeking out positive situations and actions
- Treatment uses principles from conditioning
- Not all disorders can be explained by reinforcement
- Treatment is only effective in the therapist's office
- Criticized for treating people as simple reflexive beings that just react to their environment, rather than having the ability to plan, remember, and predict things in their world
- **[4] Cognitive**
- Assumes that a psychological disorder result from maladaptive or inappropriate ways of selecting/interpreting information from the environment
- Anxious not because of what's happening around us, but because of the way we interpret those events
- Experience and learning play an important role in shaping maladaptive thinking
- Treatment focuses on positive interpretations of situations
- **Aaron Beck**
- **Depressogenic Schemata:** Maladaptive thinking processes.
 - o Under stress, people with these tendencies develop unrealistically negative interpretations of events, which lead to negative views of themselves, the world, and their futures

Cognitive-Behavioural Therapy: Treats psychological disorders by focusing on both disordered thoughts and behaviours.

Mood Disorders

- Characterized by disturbances in emotion
- Two main types of depressed mood disorders:
- **[1] Unipolar (Major) Depression**
- Ex. Bob lost his job as a MapleStory GM four months ago
- Instead of searching for a new job, he spends his time sleeping

- He has little interest in doing anything and finds it hard to get out of bed
- He's normally very active, but lately he has little appetite and feels chronic headaches
- When he tries to do something, he moves slowly and has difficulties concentrating on the task at hand
- His mind is filled with negative thoughts
- Depression can present itself in a less severe form and not every symptom needs to be present for a clinician to make a diagnosis
- Episodes of major depression are recurrent
- Person usually returns to normal in between episodes
- Should be treated due to suicide/harmful risks
- **[2] Bipolar Depression**
- Individuals alternate between severe depression and mania
- During mania, a person experiences heightened self-esteem, activity, energy, and sleep little
- Ex. Bob feels that his thoughts are racing ahead of his ability to deal with them
- May do things that are potentially risky (ex. Sexual promiscuity, unrestrained buying sprees)
- May become very angry at anyone who serves as an obstacle to goals

Dysthymia: Chronic variant of depression in which individuals exhibit persistent, moderate levels of depression.

- Rarely return to normal levels of functioning in between bouts of depression

Anxiety Disorders

- Characterized by persistent feelings of anxiety that interfere with daily activity
- Viewed as displaced tension between the ego and the id by the psychoanalytic model
 - o Id: Immediate impulse gratification
 - o Ego: Blocks inappropriate ego impulses
 - o Creates anxiety and how this anxiety is displaced can lead to symptoms of anxiety disorders
- **[1] Generalized Anxiety Disorder**
- Causes continuous anxiety throughout various, trivial situations
- Ex. Anxious about getting to work
- Experience extreme feelings of anxiety for at least six months
- Can cause pervasive physical symptoms
- Ex. Dizziness, sleep problems, fatigue, nausea, headaches, difficulty concentrating
- **[2] Obsessive-Compulsive Disorder**

- Recurring obsessions or compulsions that disturb the person or interfere with daily living
- Obsession is an idea, impulse, or image that the mind cannot rid
- Compulsion is a behavioural ritual that a person feels compelled to perform over and over again
- Person knows the ritual is unreasonable, but still feels anxious if the ritual isn't completed
- Ex. Hand-washing is a common compulsion (done 40x/day)
- **[3] Post-Traumatic Stress Disorder**
- Occurs following a highly traumatic incident
- Feelings of persistent anxiety and intrusive thoughts about the event occur
- Ex. Survivors of sexual abuse
- May have flashbacks to the traumatic event
- Re-living the memory where a person actually thinks and feels like the event is happening again
- Feel the need to avoid certain situations, objects, or people that remind them of the traumatic event
- May suffer from nightmares and intrusive thoughts, and feel depressed, irritable, easily startled
- Helpful for trauma survivors to discuss the event in detail

Somatoform Disorders: Psychologically caused disorders with physical symptoms that cannot be explained by physiology.

- **[1] Conversion Disorder**
- Specific sensory/motor symptom (ex. Pain) without any physiological cause
- Ex. Sudden loss of vision
- Usually develop during a stressful situation and symptoms appear suddenly
- Believed to be caused by traumatic hidden memories by Freud
- **[2] Hypochondriasis**
- Most common
- Persistent fears of having a serious illness, despite medical evaluations and reassurances to the contrary
- May report a pattern of symptoms consistent with feared illness
- May be generated partially by misinterpretations of bodily signals
- Ex. Overreact to a common cold
- Therapy involves educating the patient to reinterpreting the bodily signals more accurately

Psychophysiological Disorders

- Partially caused by psychological problems
- Ex. Being anxious may lead to headaches
- Physical disease that can be treated physically
- Ex. Tylenol would alleviate the pain from the headache
- Can be explained by physiology

What is the main difference between the foot-in-the-door effect and the low-ball technique?

- ☐ In the low-ball technique the only people who are affected by the phenomenon are those who are putting money into the agreement
- ☐ The foot-in-the-door technique involves an escalation of terms of an agreement after someone has initially agreed
- ☒ The low-ball technique involves cognitive dissonance
- ☐ The foot-in-the-door technique involves cognitive dissonance

Correct

Correct. Only the low-ball technique involves cognitive dissonance the foot in the door effect does not.

Module 2 – Obedience

Stanley Milgram's Experiment (Experimental Ethics)

- Examine the effect of punishment on learning
- Subject is the teacher and the learner is a confederate
- Learner is connected to shock electrodes while you as the Teacher quietly watch
- Learner mentions that he has a heart condition
- Experimenter assures the subject that the shocks would do no permanent damage
- Each switch is marked a shock voltage ranging from 15V to 450V
- Experimenter tells the teacher to give the learner a shock every time he gives an incorrect answer and for every error, you will progressively give a higher shock
- As the shocks grow more intense, the learner's complaint becomes more demanding with the learner screaming he wants to stop and his heart is bothering him
- You look to the experimenter and ask what you should do and he says "continue on"
- Learner eventually stops responding altogether and you are very concerned but the experimenter says "you have no choice, you must go on"
 - Will you continue to deliver shock?
- 65% of the subjects continued to the end of the experiment and delivered the shock labeled "Danger, High Voltage" to a non-responsive man with a heart condition

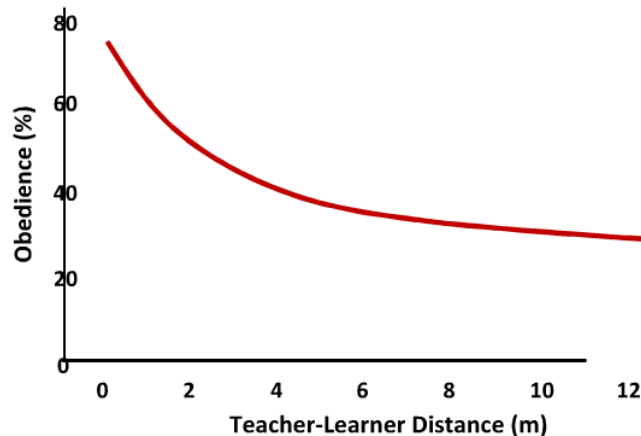
Important Lessons from Milgram's Experiment

- Strong tendency of obedience to authority, even if power is limited
- Ordinary ppl tend to obey a man in a white lab coat
- You are not always an accurate judge of how you would behave in a given situation.
 - Everyone asked about this study says that he or she would certainly not have obeyed.
 - Reality is that 65% of those that say so are simply wrong
- During the experiment, most subjects were emotionally devastated by the experience. (You were obeying orders to harm a human)
 - People argued that Milgram's exp was unethical
 - Milgram argued that his subjects were not emotionally scarred after the experiment

- Most of his subjects were even happy to have participated and fascinated by their willingness to obey authority

Manipulations

- One explanation for the high obedience rate was the inherent prestige with the following the directions of a faculty member at Yale University
 - Obedience rates dropped when
 - the experiment was moved to a less prestige setting (ex: rundown office)
 - a graduate/undergraduate student replaced the experimenter to supervise the proceedings
 - Higher the prestige of the facility, higher the obedience
- Another reason why subjects continued to obey was because they were physically separated from the learner
 - Obedience was lowest when teacher actually had to place learner's hand on the shock electrode to deliver punishment
 - The physically closer the teacher and learned were made to be, the lower the proportion of subjects who obeyed the instructions to continue



- Third factor influencing obedience was the proximity of the experimenter to the teacher
 - Experimenter stood beside teacher in original experiment
 - When experimenter issued his orders over the phone, only 25% of the subjects obeyed
 - some of the subjects delivered shocks of lower intensity than the procedure required

Obedience in The Real World

- A man posing as a doctor asks the nurse to administer a large dose of a fake drug to a confederate posing as the patient

- By agreeing to administer the drug, the nurse would be violating a number of important rules
 - the dose is higher than max dose required
 - medication orders should never be take over the phone
 - the fake medication was not on hospital's list of medications
 - nurse is taking orders from an unfamiliar voice
- 95% of the nurse said that they would not obey the order but 21/22 nurses actually obeyed!
- Experiment demonstrates:
 - Your tendency to obey can be irresistible under a variety of circumstances
 - You can never quite know how you would act until you are placed in a given situation

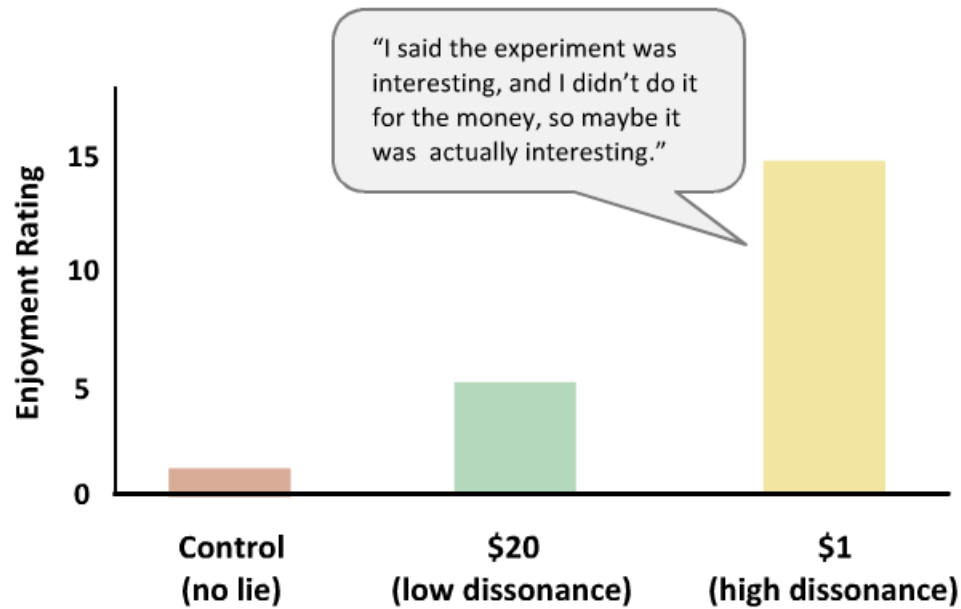
Module 3 – Cognitive Dissonance

Attitudes and Behavior

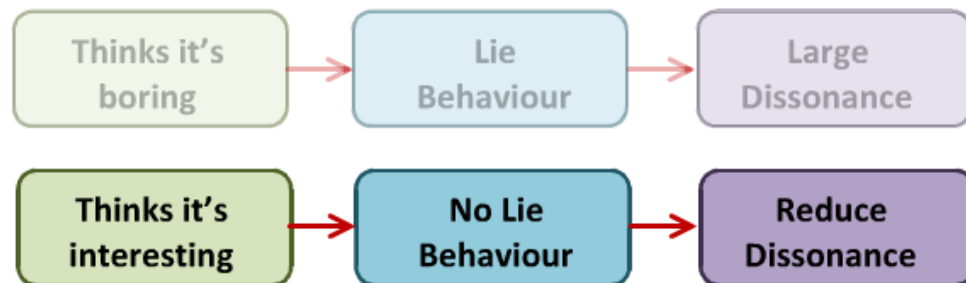
- Manner is not always consistent with your attitude
 - You don't feel happy about a telemarketer calling your home phone, but you behave politely
- When you conform to a group, obey a command, or follow a social convention, you are performance behavior that is not necessarily in line with your attitudes
 - Can your chosen behavior effect your attitudes?
 - cognitive dissonance

Cognitive Resonance

- As a subject, experimenter tells your that the experiment would be very exciting but you are actually disappointed by how boring it was
- Next subject is told to believe that the experiment will be interesting and experimenter asks if you will tell the next subject how exciting the exp was.
 - for the trouble of lying, experimenter pays you \$1 or \$20
- After you fill out a questionnaire to get your true opinions of the experiment
- The group paid \$1 to lie rated the experiment higher in enjoyment compared to the group paid \$20 to lie and a control group who did not have to lie at all
 - You would assume that ppl paid more money to lie would rate the expt as being more interesting
 - \$1 group rated higher due to cognitive resonance
- Subjects ask themselves "why did I tell the next subject that this experiment was exciting?" because they actually believed that the experiment was boring but told the subject it was fun
 - there's an inconsistency b/w their attitude and behavior



- This inconsistency b/w attitude and behavior produces an uncomfortable feeling called **dissonance**
 - To reduce dissonance, there is an adjustment in attitude to be in line with the active behavior.
 - So subjects change their attitudes to match their behavior and decide to themselves that the experiment was more interesting than they initially thought



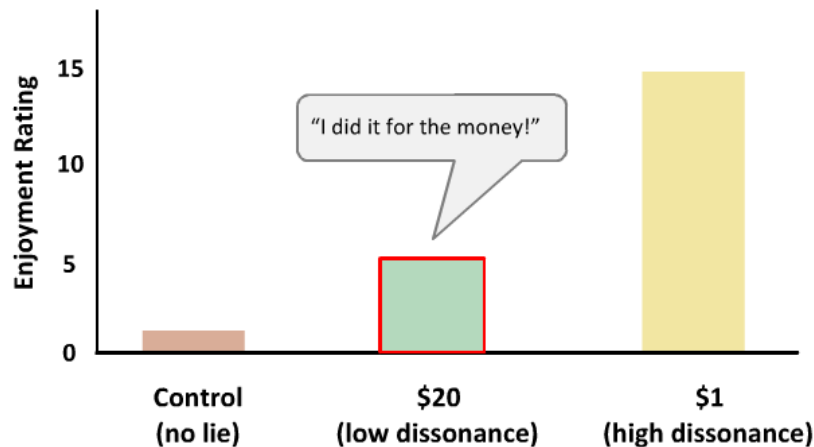
Studies on cognitive dissonance and attitude change have shown that:

- The subjects paid \$20 in the Festinger and Carlsmith study had an easier time telling the next subject how fun the experiment was compared to those paid \$1.

Overjustification Effect

- \$20 group did not change their attitude towards the expt

- When the \$20 group ask themselves why they lied, they simply decide that they did it for the money
 - They feel no dissonance because there is no conflict b/w attitude and behavior
- Their attitude is intact and they can go on believing that the expt was boring
 - Their behavior is inconsistent with this attitude due to the motivation of the large \$20 reward



- For **cognitive dissonance** to take place, there must be insufficient justification for a behavior in conflict with the attitude.
 - a \$1 reward is insufficient justification for lying to most ppl
- If you overjustify behavior with outside motivation (ex: money), attitude change is less likely to take place
- Example: you want your messy roommate to help clean
 - One way to motivate him is to give him a large reward (instrumental conditioning)
 - you may reinforce this behavior but it will stop once reinforcement is gone
 - Original attitude that cleanup is boring and low priority will still remain
 - Alternate strategy is to convince him to clean the dishes as part of a group activity
 - he may unconsciously ask himself why he's performing this behavior
 - the dissonance b/w his original attitude towards chores and the active behavior of washing the dishes may lead him to change his attitude to be in line with his new behavior
 - he might tell himself that he cleaned the dishes because helping out chores is fun

**Conclusion -
Demonstration of Cognitive Dissonance and Overjustification)**

- Once there was a man who liked to be left alone but everyday a group of kids come to play on his lawn.
- He told the kids he loves it when they play on his lawn and he pays the kids took the \$1 to come back and play again tomorrow
 - kids were excited and took the money
- next day, kids returned and the man said that he's on a tight budget and he can only spare 50 cents each for them to come back and play again tomorrow
 - kids took the 50 cents and returned
- next day he says " I just don't have any money to give you but I would love it if you returned tomorrow and played on my lawn
 - kid replied " sorry mister, it's just not worth out time to play here for nothing"

Tina eats out at fast food restaurants 4 days a week. She has recently joined a health club and decided to cut down on fatty foods. However, she hasn't been able to stop eating there out of habit. Which of the following is true of this situation?

- ☒ Tina's dissonance could be reduced if she told herself that she is too busy right now to eat healthily and will start over the summer.
- ☐ An inconsistency between two attitudes, that she wants to eat healthy but loves fast food, are the cause of dissonance for Tina.
- ☐ Tina's behaviour, eating healthily, and her attitude, loving fast food, are in conflict and creating cognitive dissonance.

Module 4 – Stanford Prison Experiment

Zimbardo's Prison

- purpose of experiment was to study the behaviour of normal people under situations of authority
- 24 subjects were selected and each passed a criminal record check, a psychopathology screen, and anti-social behavior screen
- Those assigned to be prisoners had some of their normal civil liberties suspended for the length of the experiment
- With cooperation of the police, the 'prisoners' were mock-arrested, fingerprinted, photographed, given uniforms, and put into prison
- Subjects assigned as Guards were told to maintain the reasonable degree of order in the prison necessary for its effective functioning

The Aftermath

- Study was expected to last for 2 weeks but ended after 6 days because of the sadistic behavior of the subjects assigned as guards

- 5 prisoners suffered extreme depression, crying, rage, anxiety
- When expt ended, the subject assigned as prisoners could not believe their good fortune as most were willing to forfeit their pay for the ability to leave the study early
- The subjects assigned as guards never failed to show up for their shift and most of them voluntarily stayed late without pay
- Guards demonstrated dehumanizing behaviour
 - called prisoners by their numbers, forced them to wear face coverings, stripped them naked
- Zimbardo reported that “some guards were tough but fair, some went far beyond their roles to engage in creative cruelty and harassment, while a few were passive”

Controversial Results

- Expt demonstrates the power that circumstance + assigned role can lead to shocking behaviour
- Guards passed initial psychological testing, but were later reported as being pathological or ‘sadistic’ (pleasure from inflicting pain)

Deindividuation

- The shocking behavior may be due to the degree to which the participant were made to be anonymous
- Guards wore uniforms and reflective glasses which hid their faces and prisoners were dressed alike, and only identified by a number, rather than by name
- **Deindividuation** is the loss of a sense of personal responsibility and restraint in a group situation
- In one expt, subjects wore coats and hoods to obscure their faces and become anonymous before being asked to deliver electric shocks to a confederate of the experiment
 - In comparison to subjects who wore normal clothing and name tags, the hooded subjects shocked the confederates significantly longer
- Deindividuation can occur naturally in crowded cities
 - the battery and radiator of a old car left in New York were stolen within 10 minutes of putting them there and after 3 days, 23 incidents of vandalism were recorded
 - the old car left in a small town Palo Alto had only one person touch the car and it was to lower the hood in the rain

Module 5 – Persuasion

The Communicator

- Most persuasive communicators are those with high credibility
 - Those who are perceived to be experts in a particular field are more persuasive than those who are not
 - Ex: you trust advice from doc more than a bartender
- Persuasiveness of a speaker is physical attractiveness
 - Attractive communicators sell more products
 - Drawn to communicators that look or sound similar to you
 - Someone you can relate to is certainly an asset
 - Ex: if you are looking for a new video game, you are more likely to be convinced by teenager boys playing the game than a 5-year old
- Expert communicators are more persuasive than non-experts, but you are also more persuaded by those similar to you
 - Which is more important > similarity or credibility?
 - Similarity is more persuasive for personal lifestyle choices
 - Credibility is more persuasive for matters of objective fact
- Techniques to make your more persuasive as speech style influences perceived trustworthiness
 - Concise speech, well-paced speech speed, and eye contact
 - **Norman Miller found that tape recorded messages are rated as more knowledgeable and persuasive when they are played faster**

The Message

- When convincing someone, you can present a one-sided or two-sided argument
- When audience initially agrees with your position, a one-sided argument is most effective
- When audience initially disagrees with your position, a two-sided argument is most effective
 - you acknowledge opposing opinions, respond, then present arguments for why your position is better

The Audience

- **Academic/intelligent audience** is more likely to be persuaded by **central appeals**

- Well reasoned, factual, two-sided arguments
- Audience actively contributes to making a decision on their own (this is why web modules present experiments with conflicting findings)
- Central thinkers requires a good message
 - If audience is going to think a lot about your argument, a strong message will be worth the effort
- In less academic setting/unintelligent audience, they are more persuaded by peripheral appeals
 - Well presented, easy to understand messages
 - Rely on quick decision making based on easy heuristics, such as attractiveness
 - Peripheral thinkers require a good communicator
 - If audience is not going to think much about your argument, a strong msg is no better than a weak msg

Module 6 – Techniques in Persuasion

Officer Scott

- Stewart was arrested for making a prank call to a restaurant claiming himself to be a police
- Stewart asked for the manager on duty and described an employee who he said was suspected of stealing a customer's purse
- Following Stewart's instructions, the manager searched employee
- Eventually the requests over the phone became progressively bizarre and they realized it was a prank

The Foot in the Door Effect

- First, Stewart used the language of police jargon and assumed the identity of a police to establish himself as a strong authority
- Second, he used a gradual escalation of demands – first directing questions, following by directing a search the employees purse and pockets, before moving on to greater offences
- This gradual escalation of demands increases obedience
 - Known as the **Foot in the Door Effect**
 - Named after the door-to-door salesmen who lure customers in with small requests
- Experiment 1

- Researchers posed as drive-safe volunteers and asked residents of neighbourhood to put up a large “Drive Carefully” sign on their yard
 - 17% of the ppl agreed to this inconvenience
 - However, if the researchers first asked the residents to put up a smaller sign
 - Nearly everyone agreed to later put up the larger sign
- Experiment 2
 - The % of Toronto residents who were willing to give to a charity doubled if they first agreed to wear a pin for the charity, the day before
- The foot in the door effect is powerful because any one request in a series is considered in relation to the previous request
- A request that seems outrageous in isolation is seen as being less unreasonable if it follows previous requests of escalating magnitude

Low-Ball Technique

- An escalation of the terms of an agreement after someone has already agreed
- Compliance is secured at a smaller cost, only to later reveal additional costs, while making the initial decision seem irreversible
- A customer might agree to purchase a product because of its initial low price.
 - As he starts completing the forms for the purchase, the dealer announces additional charges and hidden costs
 - The customer may follow along, removing the advantage of the initially low price
- Students were invited to participate in an expt that began at 7am and 24% showed up
- However, if students first agreed to participate in expt and then told the time it would be held, 53% showed up
- When people ask you to perform a small favour, you need to be aware of whether a larger request is likely to follow

What is the main difference between the foot-in-the-door effect and the low-ball technique?

- ☐ In the low-ball technique the only people who are affected by the phenomenon are those who are putting money into the agreement
- ☐ The foot-in-the-door technique involves an escalation of terms of an agreement after someone has initially agreed
- ☒ The low-ball technique involves cognitive dissonance
- ☐ The foot-in-the-door technique involves cognitive dissonance

Correct

Correct. Only the low-ball technique involves cognitive dissonance the foot in the door effect does not.

Module 2 – What is Abnormality?

The Four D's

- Behavior varies between people, cultures, and time periods
- Set of criteria's used to define abnormality:
 - Deviance
 - Distress
 - Dysfunction
 - Danger
- Exhibiting one or more of these characteristics does not necessarily label someone as having a psychological disorder

1 – Deviance

- Refers to having thoughts, emotions and behaviors that fall far outside the standards of what others are doing.
 - Cultural practices of minority pop. are not considered to have psychological disorders because they are being “different”
- Includes those who fall well below and well above the standard of the group.
 - If we label people with very low IQ disordered, should we do the same to those with very high IQ?

2 – Distress

- psychological disorders often cause strong feelings of distress
 - person experiences intense negative feelings due to their behaviour such as anxiety, sadness, or despair
- person who's free of distress is not necessarily psychologically healthy
 - bipolar patients in the manic phase often feel extremely elated and larger than life – certainly not distressed
 - patients with antisocial personality disorder also show no feeling of remorse or distress when causing harm to others

3 – Dysfunction

- psychological disorder often cause behaviour that tends to interfere with the person's ability to function in their daily lives.
 - Behaviors that are dysfunctional are often “maladaptive”
 - prevent an individual's adaptability to environment
- dysfunction alone does not prove that a psychological disorder exists
 - Dysfunction may be voluntary
 - person may choose to stop functioning in society as a means of protest, like someone on a hunger strike

4 – Danger

- psychological disorder often cause a person to place themselves or others in danger.
- dangerous behaviour alone does not prove that a psychological disorder exists
 - many people engage in dangerous behaviors everyday
 - ex: athletes who participate in extreme sports don't get weekly exercise or office workers eat unhealthy food

Module 3 – Classifying Disorders

The DSM

- **Diagnostic and Statistical Manual (DSM)** provides standardized criteria to aid in the diagnosis of psychological disorders
- TWO functions:
 - Categorizes and describes mental disorder so that clinicians will have a common set of criteria for applying diagnosis
 - Allows researchers to talk to each other about mental disorders using a common language

- TWO general diagnostic criteria:
 - Disordered behaviour must originate from *within* the person, not as a reaction of external factors
 - Ex: person who is crying uncontrollably with thoughts of despair wouldn't necessarily be diagnosed with clinical depression if they had just lost their entire family in a car accident
 - This observed behaviour is a normal response to an external factor.
 - Disordered behaviour must be involuntary
 - Person suffering from the disorder is unable to control the symptoms that they experience
 - This rules out someone who chooses to dress up in crazy cloths or someone who is on hunger strike as a means of protest

Categories in the DSM

- DSM groups together disorders that have similar sets of symptoms due to assumption of common cause & therefore similar treatment
- The Axes
 - Axis I: Clinical Syndromes
 - Axis II: Developmental Disorders & Personality Disorders
 - Axis III: Physical Conditions
 - Axis IV: Severity of Psychosocial Stressors
 - Axis V: Highest Level of Functioning

Module 4 – Models of Psychopathology

Functions of Models

- DSM only describes a pattern of symptoms
- DSM does not provide an explanation for the disorder or treatment plans for disorders
- Models in psychopathology attempts to explain the causes of the disorder and to help decide how to treat it
- FOUR models:
 - Biological (medical/disease model)
 - Psychodynamic
 - Behavioural
 - Cognitive

Biological Models (Medical or Disease Model)

- Psycho-disorders due to malfunction in internal brain activity.

- Brain may malfunction is caused by:
 - Physical damage
 - Abnormal activity of chemicals (neurotransmitters)
- Points to genetics, nutrition, disease, and stress to explain brain malfunction
- Treatment often relies on drug therapy, electroconvulsive shock or brain surgery

Psychodynamic Model

- Pioneered by Sigmund Freud
- Mental disorder originates in an internal malfunction; psychological malfunction (not physical)
- Mind and its processes are not working properly due to mental conflict in the mind
 - Maladaptive attempts to deal with strong, unconscious conflict
 - Conflict may be due to unresolved childhood issues
- Physical therapy can't cure a mental disorder – it only temporarily relieves the symptoms.
- Treatment relies on **psychoanalysis**
 - Focus on personal insight, awareness, and root of problem
 - Help patients understand themselves so they can cope better with underlying life stressors

Behaviourist Model

- Disordered and maladaptive behaviors that we see on the outside are symptoms of the internal problems
 - ex: fever is a symptom of infection or a limp may be symptom of leg injury
- Behaviourism views psychological disorders as external, overt behaviour rather than an internal malfunction
- Disordered behaviors are established through classical and instrumental conditioning.
- Contingencies, rewards and punishments received for our actions influence our behaviors
 - Ex: your behaviors lead to sympathy and attention of others or keep you out of anxiety-producing situations
 - disordered behavior provides “rewarding” attention from others
- Treatment uses principles from conditioning and focuses on seeking out positive situations and actions
 - ex: classical conditioning can be used to treat phobias
- Down sides to behaviourist model:

- Can you really say that someone who hears and responds to voices in their head has learned to behave that way?
- Behavioural treatment is often effective while inside the comfort of the therapists' office, it does not always transfer well to other environments
- Model treats people as simple reflexive beings that just react to their environment, rather than having the ability to plan, remember, and predict things in their world
- These criticisms can be addressed by the cognitive model

Cognitive Model

- Mental disorders result from maladaptive, negative interpretations of environment and life events.
- We are depressed not because what is happening around us, but rather because of the way we interpret those events
 - ex: When you do a speech, it isn't the audience per se that causes your anxiety, but rather, the way the speaker interprets that situation that makes them enjoy or be anxious
 - the speaker may think: is it a chance to deliver an effective message or is it a chance to be negatively evaluated?
- How you interpret this situation is going to lead to different behaviors, even abnormal behaviors
- Assumes that experience and learning play an important role in shaping maladaptive thinking.
- **Cognitive-behavioural therapy (CBT)** combination of:
 - Cognitive therapy focuses on positive interpretations of situations
 - Behavioural therapy focuses on seeking out positive situations and actions

Module 5 – Mood Disorders

Characterizing Mood Disorders

- Mood disorders are characterized by disturbances in emotion
 - Includes both depressed mood of depression and elevated mood of mania
- TWO main types of depressed mood disorders
 - Unipolar depression
 - Bipolar depression

Unipolar Depression

- Symptoms of unipolar or **major** depression:
 - Little interest in doing anything
 - Stays in bed and not very active
 - Little appetite
 - chronic headache, muscles sores, fatigues
 - slow movement and can't concentrate on tasks at hand
 - mind filled with negative thoughts and guilt
 - thoughts of suicide
- Episodes of major depression are recurrent, but left untreated, can last for several months.
- In between episodes, person usually returns to normal functioning
- Due to the suicide risk and harmful effects of depression to a person's social well-being and physical health, it is not advisable to leave depression untreated

Dysthymia

- Chronic variant of depression
- Has less severe symptoms of depression
- Rarely return to normal levels of functioning
- Exhibit persistent, mild levels of depression all the time

Bipolar Disorder

- Alternations between severe depression and **mania**
 - Heightened self-esteem, activity, and energy
 - Sleeps very little
 - May feel that his thoughts are racing ahead of his ability to deal with them
 - Do things which are potentially risky:
 - sexual promiscuity
 - high-risk business investments
 - unrestrained buying sprees
 - become very angry at anyone who serves as an obstacle to his fanciful goals

Biological Cause of Depression

- Abnormal levels of chemical activity of (NT) in brain
 - Treated with drug therapy

- Antidepressants change the balance of NT in the brain

Behavioral Cause of Depression

- Depression arises in individuals who lack social skills
 - difficult for them to elicit normal positive social reinforcement from others
 - lead to lowered mood and self-blame of depression
- Depressive symptoms may elicit sympathy, attention, and concern from others
 - may unintentionally lead to further reinforcement of the symptoms
- Depressive symptoms may also result from a sense of **learned helplessness** about a situation in which the subject learns to withhold responding
 - Learn to give up and passively accept the circumstances

Cognitive Cause of Depression

- Depression arises in individuals who have a particular and maladaptive way of evaluating themselves and their experiences
 - Aaron Beck calls these maladaptive thinking processing **depressogenic schemata**
 - Under stress, depressed individuals view many neutral or positive events as being negative, due to their own actions,
 - leads to very negative views of himself, the world, and his future

Psychological Treatment

- Psychoanalysis
 - Promotes insight and awareness
 - Help patients have an increased understanding of themselves
 - Strengthen coping strategies of the patients
- Cognitive Behavioural Therapy (CBT)
 - make people more aware of how they think and understand how the way they think contributes to how they feel
 - patients are encouraged to set goals and do tasks such as calling up a friend, so they can practise their behavioral skills.
 - Effective against relapse of future episodes of depression
- CBT alone may not be sufficient for cases with high suicide risk and debilitating (to weaken) depression
- Most common for psychological and biological treatments to be used in combination

Module 6 – Anxiety Disorders

Introduction

- Affects approx 1 in 10 people
- Anxiety disorders cause persistent feelings of anxiety or worry that interfere with daily activity and relationships
 - Suffer from intense, prolonged feelings of fright and distress

Generalized Anxiety Disorder (GAD)

- Continuous anxiety and worry about minor things like normal life events and routine activities
- Person diagnosed with GAD experiences these extreme feelings of anxiety repeatedly for at least 6 months
- People with GAD experience pervasive physical symptoms
 - Feeling tense and this can lead to dizziness, sleep problems, muscle tension, headaches, fatigue, and nausea
- They have difficulty concentrating and can often feel irritable

Obsessive-Compulsive Disorder (OCD)

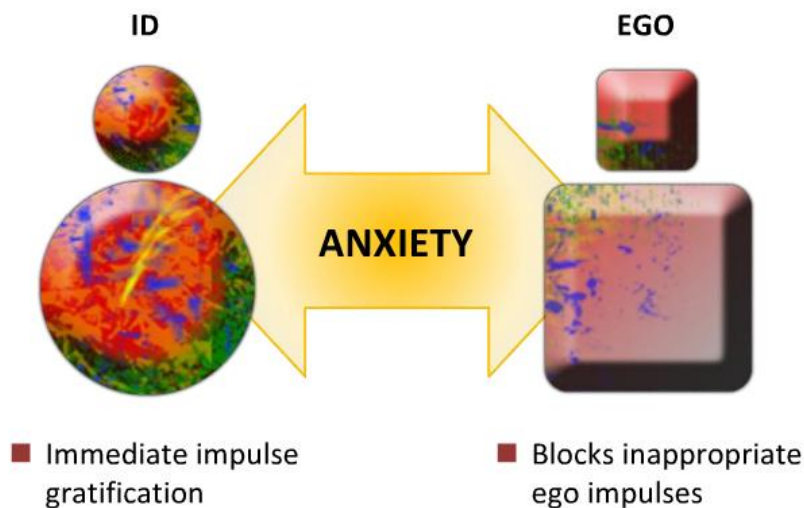
- Symptoms are recurring obsessions or compulsions that disturb the person or interfere with day-to-day living
- **Obsession** - idea/impulse/image that we can't get out of our minds
 - Recurring idea that we have done something wrong, or the persistent fear that a loved one has been injured
- **Compulsion** – a behavioural ritual that a person feels compelled to perform over and over again
 - Person knows that the ritual is unreasonable, but feels anxious if the ritual is not completed
 - Common compulsions is hand washing (20-40 times a day)
 - Interfere with everyday life and lead to tissue damage

Post-Traumatic Stress Disorder (PTSD)

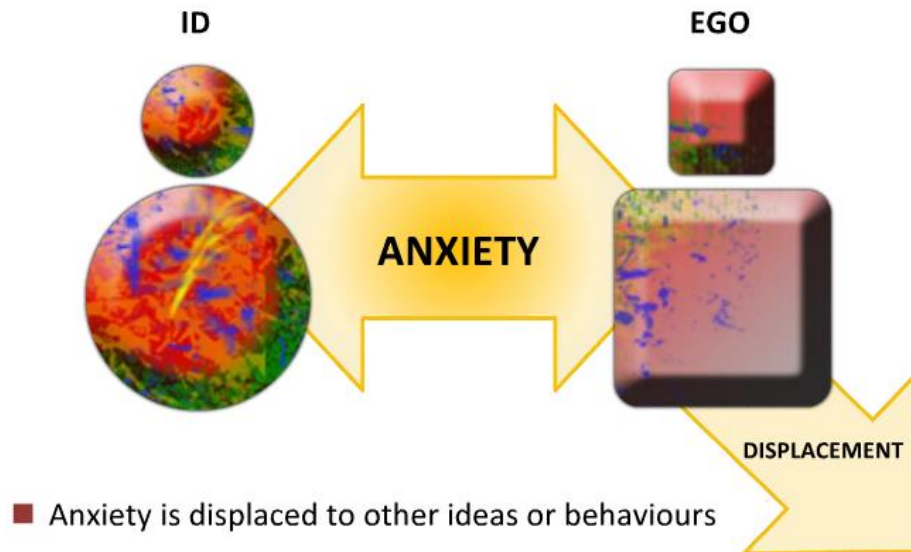
- PTSD occurs following a highly traumatic incident that may have caused physical harm to you or someone close to you
- The sudden and unexpected death of someone close to you can also lead to **PTSD symptomology**
- Common in survivors of sexual abuse, natural disasters, & accidents
- Symptoms:

- Feelings of persistent anxiety, intrusive thoughts and nightmares about the event occur
- Flashbacks to the traumatic event – re-living the memory of the trauma where a person actually thinks and feels like the event is happening all over again
- Feel the need to avoid certain situations, objects, or people that reminds them of the traumatic event
- feel depressed, irritable, easily startled, hypervigilant, and have trouble concentrating
- Symptoms last for many years after the event has happened.
- To reduce risk of developing PTSD, it is helpful for trauma survivors to discuss the event with one another as often as possible and in as much detail as they can remember

Etiology/Cause of Anxiety Disorders



- Psychoanalytic model views most anxiety disorders as displaced tension between the Ego and the Id
- The conflict results from id impulses, which are seeking expression, and the Ego, which can't allow it
 - this creates anxiety
 - how this anxiety is displaced can lead to symptoms of anxiety disorder
 -



- For example:
 - In OCD, the psychodynamic view is that the compulsion is a defense against an unacceptable id impulse.
 - The anxiety this unacceptable impulse causes is displaced onto a less disturbing idea or behaviour
 - The obsession or compulsion will therefore have some symbolic relationship to the true underlying problem
 - In case of GAD, the tension is displaced to everyday, unspecific events

Treatment of Anxiety Disorders

- Genetics can predispose someone to OCD and GAD
- Drug therapy and psychological therapy are effective in lowering anxiety
- Obsessions may be instrumentally-conditioned avoidance responses. When they occur, they terminate or reduce some classically conditioned fear
- CBT techniques to reduce anxiety
 - Cognitive reconstructing helps people turn their anxious interpretations of events into more rational thoughts
 - Behavioral component: repeated exposure to feared objects or situations
 - Therapy for PTSD involve repeatedly talking about the traumatic event in excruciating detail
- CBT also help people control their anxiety
 - Teaching them how to consciously slow down their breathing when confronted with a stressor

Module 7 – Somatoform Disorders

Psychophysiological Disorders

- Our psychological health has a large impact on our physical health
- Being depressed or anxious may lead to headaches, nausea, or fatigue and it can lead to lowered immune response
- They are physical diseases and can be treated physically
 - Ex: anxiety cause headache, and Tylenol relieves the pain
- **Somatoform Disorders** are psychologically caused disorders with physical symptoms and can't be explained by physiology
 - Ex: headache that doesn't go away after treatment
 - Ex: numbness in your limbs yet circulation is perfect
 - Ex: pain in your left hand, but your left arm was amputated

Conversion Disorder

- Type of somatoform disorder where there is a specific sensory or motor (physical) symptom without physiological causes
 - Ex: sudden loss of vision or suffer from paralysis for no physiological reason
- Develops during a stressful situation
- Symptoms appear suddenly
- Freud believed that conversion disorders were due to traumatic hidden memories
- Psychodynamic model seem to have little effectiveness in treatment

Hypochondriasis

- Most common form of somatoform disorder
- Persistent fears of having a serious illness, despite medical evaluations and reassurances to the contrary

- Person may be preoccupied with having a particular illness and report a pattern of symptoms consistent with it
- Generated in part by misinterpretations of bodily signals
- People who overreact to common symptoms like stomachaches, headaches, or common colds, are more likely to believe that they have a serious illness, and pay more attention to these symptoms in the future
- Therapy often involves teaching the patient to reinterpret these bodily signals more accurately
- Med-Student syndrome is a form of hypochondria characterized by anxiety about having one or more of the disorders being studied

Module 1 – Categorization

Introduction

- Attention > focus finite mental resources on key parts of the active scene
- Memory > recall specific behaviors which are appropriate to your current needs
- Your cognitive ability to put people, objects and ideas into categories and concepts helps you to efficiently process through incoming data/stimuli and make appropriate responses
- If we couldn't categorize objects, events and ideas, making the simple decision can become an overwhelming task
 - Ex: Should I offer my seat to an old man? Do people normally do this? What should I do? Why is he holding a long stick?
- Without the cognitive ability to categorize, every sensory experience would be completely unique.
 - You're unable to draw connections with the past and forced to make unique decisions on even the most routine actions
- Categorization guides your decision making
 - Placing your current situation into a category which you had previous experience (ex: hangover), you'll know what actions/decisions to take (take aspirin/water)

Module 2 – Functions of Categorization

Why Categorize?

- 1) Classification allows you to treat objects that appear differently as belonging together
 - Ex: green and red apples are classified as 'apples' and both are safe to eat
- 2) Categorization allows for understanding
 - If we categorize the scene in front of as two people shouting, we understand that they are in a fight and likely don't need your opinion
- 3) Categorization allows for predictions
 - By categorizing your current experience and comparing it to similar experiences in memory, you can make predictions about your current situation
 - Ex: if you know the creature in front of you is a dog, you can predict that it would like to be scratched on the back and wag its tail when happy
- 4) Categorization allows for communication
 - Words refer to some type of category or concept (such as furniture, cat, sport)
 - Using the category name allows for efficient communication
 - Communication would be much slower if you had to describe the meaning of everything you say
 - The extend of this automatic categorization process is seen when people of specialized fields speak in technical terms

Illusion of the Expert

- Is the feeling that something must be simple because you are so good at it but not everyone can do them
 - Ex: tying your shoes may be child's play to you, but not to a child
- The ease with which humans are able to categorize

Module 3 – Categorizing with Rules

Introduction

- Categorization may be as simple as applying a set of rules
 - Ex: You think that all turtles have a shell, so when you see something with a shell, you categorize it as a turtle

- Consider category of bottles. Does your definition include baby and pill bottles but exclude jars, glasses or cartons?

%yes	Category	Include...	But not...
84%	table	coffee table, pedestal	bed, counter, iron board
88%	bottle	baby bottle, pill bottle.	jar, glass, carton
64%	dog	Chihuahua, greyhound	wolf, fox, coyote
84%	tree	sapling, pine, palm, bonsai	bush, vine, bamboo
40%	fruit	melon, coconut, grape	squash, almond
56%	furniture	rug, chair, desk	table saw

- For simple categories (ex: table), we are quite susceptible to the illusion of the expert
- For more complex categories (ex: fruit), the number of people who can identify a simple categorization rule decreases
- Much more difficult to define abstract categories such as beauty, freedom or justice

When Rules Aren't Enough

- How would you categorize a bachelor? A simple rule to define it would be an unmarried male but it includes the Pope and baby boys (both meet this criteria)
- When asked to define rules, you may find it difficult to properly include and exclude items for category membership, yet when given a test stimulus, you can effortlessly decide membership.
 - Suggests that humans have an internal representation of categories that is independent of the rules we try to define

Module 4 – Prototype Theory

Prototypes

- We categorize objects by comparing them to an internal representation of the category called a prototype
- Prototypes: the average or 'best' member of a category
 - Ex: Picture a fruit. An image of an apple or orange came to mind
- Prototypes are formed through experience and can be very personal because all the objects you've previously encountered are averaged together
 - Ex: Your bird prototype might look like a robin because you've seen a lot of birds that look similar to robins in your lifetime.

Categorization Using Prototypes

- The further away the new object (ex: tree) is from your prototype, the less likely it is to be categorized as your tree prototype
- The new object might actually be close to your bush prototype
- Subjects responded very quickly to "a robin is a bird" and much slower to "A penguin is a bird".
 - Suggests that more typical category members (likely closer to prototype) are categorized more quickly and easily than atypical category members

Problems with Prototypes

- If you were to write down your prototype fruit, bird, chair, house, and then asked the same question a week later, there is a good chance that they may be different
- If we are indeed comparing our experiences to an internal prototype, we should expect it to be stable over time.
 - Prototypes are NOT consistent over time

Module 5 – Exemplar Theory

Exemplars

- Instead of storing only one average category prototype, you store your entire lifetime worth of experiences
 - Ex: Instead of remembering just one prototype of dog, you remember every dog you have ever met.

- Each of these past instances of category membership is called an exemplar
- Theory suggests that you quickly search through your library of exemplars to compare to the current object.
- If you find an exemplar sufficiently similar to the current object, you identify it as being a member of the same category
 - If you meet a new 4-legged creature, you can determine that it looks like a dog because it looks like at least one other prior experience you have had with the category of dog

Prototype vs Exemplar Theory

- According to Prototype Theory: “A robin is a bird” was verified faster than “a penguin is a bird” because of the similarity of a robin to our bird prototype of a robin due to the fact that you’ve had lots of experience with robins in your past
- According to Exemplar Theory: “A robin is a bird” was verified faster because you have many more robin exemplars in memory than you do for more atypical exemplars, like penguin.

Evidence for Exemplar Theory

- Diagnosticians are in the business of noting symptoms and observations to correctly categorize disease to determine appropriate treatment.
- Experiences dermatologists were asked to diagnose patients by observing a series of slides of skin disorders. After 2 weeks, they returned to diagnose a second series of slides (where some disorders are repeated using different slides than first)
- Would the inclusion of a single exemplar 2 weeks earlier improve their accuracy?
 - Prototype theory would suggest NO as a single case would be simply blended into the averaged prototype
 - Exemplar theory suggest that any increase to the relevant exemplars would improve categorization performance
 - These experts were 20% more accurate on disorders they’d seen 2 weeks ago
 - The doctors were using the most readily available or most recent Exemplar rather than entirety of their experiences with hundreds of patients

Conclusion

- Prototypes can often explain categorization of relatively simple objects and situations better than exemplar theory

Module 6 – Development of Categorization

Children and Categories

- If you teach children a new fact about their pet dog (ex: dogs like treats), they can generalize that new fact to different dogs, even if they don't look exactly similar to her own (ex: other dogs also like treats).
- Children understand something about **category membership** at the age of 3
 - Members of the same categories share similar characteristics
- Children seem to have a deeper understanding of categories
 - You can turn a toaster into a teapot, if you had a toaster and covered all its holes, put a contained in it, and put a spout on the side,
 - Child will generally agree theoretically that it is possible
 - You can turn a raccoon into a skunk if you paint raccoon black with a white streak and give it a spray bottle that squirt a smelly liquid
 - Child may not agree that this is possible
- It seems that children are able to understand something about the innate properties of a given category
 - You can change the nature of a machine, but not the nature of an animal

Module 7 – Animal Categorization

Baboon Categorization

- Using instrumental conditioning, baboons were taught to classify objects as “food” or “nonfood” and were able to categorize new objects with 90% accuracy
- Next baboon had to category objects into more abstract category of “same” or different.”
 - 2 food items should be categorized as same and 1 food/1 nonfood should be categorized as different
 - The baboon was able to categorize new objects with 90% accuracy again
- Basic categorization systems exist in non-human animals

Module 8 – Conclusion

Categorization in Everyday Life

- Categorization allow us to react efficiently and appropriately to our current needs, but it also has negative costs such as **stereotypes** (categorization of different groups of ppl)
- Stereotyping assumes that an entire social group of people share the same characteristics, traits, and behaviors which forms your impression of the group
- When you encounter a new member of the social group, you may assume that this new individual will share the same characteristics, traits, and behaviors conforming to your prototype.

Module 1 – Intelligence

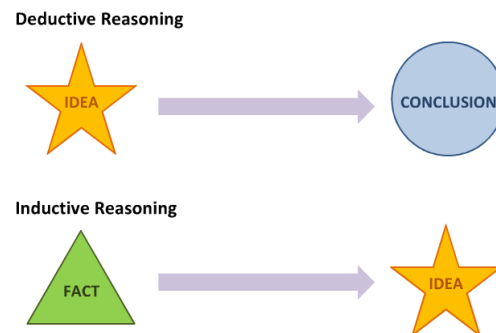
Operational Definition of Intelligence

- **Intelligence** is the cognitive ability of an individual to learn from experience, reason well, remember important information (cognitive tasks) and cope with the demands of

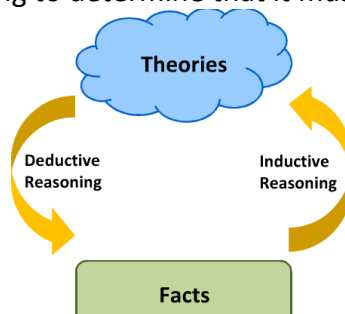
- daily living
- Intelligence is a static, internal quality

Module 2 – Problem Solving

Deductive and Inductive Reasoning



- Deductive reasoning, you come to a concrete conclusion based on a general idea
 - Ex: you tell someone it's going to rain, you can use deductive reasoning to determine that the ground will soon be wet
- Inductive reasoning, you generate a general idea given some concrete information
 - Ex: If you wake up in the morning and notice that the ground is wet, you can use inductive reasoning to determine that it must have rained overnight



- Arch of Knowledge – facts/observations about the world at the base of arch and at the top, we have theories about how these facts are related in a general way
- In science, we start with a general theory about the world, then we use deductive reasoning to generate a specific, testable hypothesis about the data we expect to obtain.
- Then through experimentation, we collect data at the bottom of the arch, and use inductive reasoning to interpret collected data and relate it to our general theory

Insight Problems

- Insight problems test your ability to think outside the box
- Insight problems may be difficult because of **functional fixedness**
 - Our difficulty to see alternative uses for common objects and get stuck thinking about a specific function only.
- Good problem solvers are good noticers

Module 3 – History of Intelligence Testing

Qualities of a Test

- Reliability – extent to which repeated testing produces consistent results
 - A reliable test produces the same result if one person takes it multiple times
 - Reliability is important for intelligence testing because intelligence is assumed to be a static, internal quality
- Validity – extent to which a test is actually measuring what the researcher claims to be measuring
 - A valid test measures only the trait it is supposed to be measuring
 - Are course assignments measuring your understanding of course material, or are they testing your ability to memorize information?
 - Does a given test actually measure your intelligence or your ability to answer certain types of questions or even your writing speed?

Francis Galton

- Formally quantify intelligence in an unbiased and reliable manner
- He recorded how quickly subjects could response to sensory motor tasks by their reaction time and concluded that faster reaction time is with higher intelligence

Stanford-Binet Intelligence Test

- Intelligence scale which included 30 short tasks related to everyday life.

- Children were asked to name parts of the body, compare lengths and weights, name objects in a picture, and define words. (assumed that all these tasks involved reasoning)
- Different versions of the test had questions appropriate to age group – so all levels of children could be tested using the new standardized intelligence test

Charles Spearman & ‘G’

- Firm believer in the idea of a single type of intelligence
- Observed that most people who performed well on classical intelligence tasks performed well on all kinds of tasks – vocab, math, special abilities, and so on.
 - There is one generalized intelligence known as ‘G’
- He excessively claimed that only individuals with a minimum level of ‘G’ should be allowed to vote and reproduce

Multiple Intelligence Theory

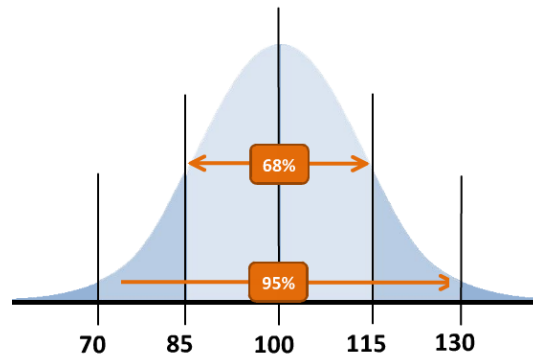
- Howard Gardner proposed a multiple intelligence theory (8 parts) and each type of intelligence is independent from the others
 - Linguistic – Verbal
 - Mathematical – Logical
 - Rhythmic – Musical
 - Spatial – Visual
 - Kinesthetic – Bodily
 - Interpersonal
 - Intrapersonal
 - Naturalistic
- Each type of intelligence is independent from the others. So you can be brilliant in verbal, yet lacking in musical
- This theory ignores Spearman’s findings that people who do well on one type of intelligence test are likely to do well on others.

Module 4 – Human Intelligence

The Weschler Scales

- Weschler’s original intelligence test was modeled on Binet’s scale
- Weschler Adult Intelligence Scale (WAIS)
- Weschler Intelligence Scale for Children (WISC)
- These scales are standardized to produce an intelligence quotient for each individual.

- IQ scoring is based on the results of large samples of individuals who have taken the test
 - Standardized so that someone who achieves the mean score will be assigned an IQ of 100
- IQ scores surrounding the mean are assigned around a perfect normal distribution with a St.Dev of 15
 - Your specific IQ is relative to the performance of the rest of the population



Genetic and Environmental Contributions

- Both genes and environment are essential to a person's intelligence (Nature vs. Nurture)
- Do the individual differences in human IQ result more from genetic or environmental differences?
- Twin study (McGue et al.)

Identical
(100% identical genes)

Fraternal
(50% identical genes)

McGue et al. (2003) Correlation between IQs of twins:

■ Identical = 0.80

■ Fraternal = 0.60

- This difference in correlation coefficient suggests a role for genes in the development of intelligence
- A correlation of +0.6 is still higher than you would expect for two random individuals from a population
 - Suggest that a role for environmental factors in development of intelligence
- When identical twins raised in different environments, the mean correlation is still quite high, at about +0.73 (strong role of genetics)
 - Most accurate to say that both genetics and environment play a role in intelligence development.

Correlations between identical twins such as 0.8 in IQ research suggest that:

- ☐ Identical twins respond the same on 80% of IQ questions.
- ☐ 80% of the variation in all IQ scores can be explained by identical twins.
- ☐ 80% of identical twins will have the same IQ.
- ☒ Identical twin' IQ scores correlate strongly.

The Flynn Effect

- Quantifies intelligence
- The mean score for intelligence testing in the population has been steadily increasing since it was first measured in 1932.
- Although IQ is standardized so the mean IQ for the population is always 100, the raw score that corresponds to an IQ of 100 has been on the rise
- Flynn Effect may be due to:
 - Increased quality of schooling
 - Increased access to information and ideas, through books, TV, and internet due to improvements in technology
 - Increased nutrition and health

Module 5 – Piaget and Intelligence Development

Jean Piaget

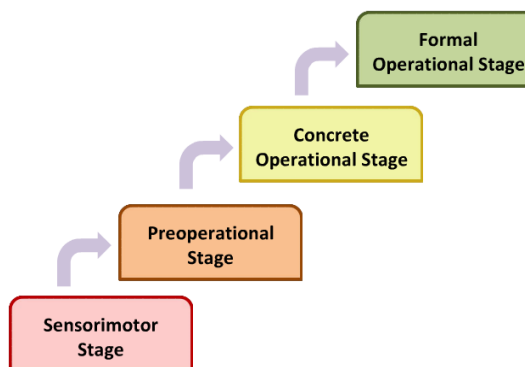
- Fundamental idea that children are active learners
 - By manipulating and exploring their environments, children incorporate new info into what they know
- You have **schemas** in your mind
 - A mental framework for interpreting the world around us
 - Ex: If Gred frowns at you, you use your schemas to interpret that he must not be happy and you can act accordingly
 - Schemas in young children are not yet developed so a young child may ignore that you are upset and focus on playing with its toy
- **Assimilation**
 - Incorporating new information into existing schemas
 - Involves manipulating incoming information so that it makes sense
- **Accommodation**
 - Modifying/altering existing schemas to fit incompatible information
 - Adapting existing interpretations of the world
- Through assimilation and accommodation, the child actively learns and develops as she

interacts with the environment

Which of the following best describes Piaget's schemas?

- ☐ Piaget would use schemas to describe the limitations of the child during the Sensorimotor and Preoperational stages.
- ☒ A schema allows you to make inferences about the behaviours of others around you.
- ☐ Is a representative example of an item contained in one of many different categories
- ☐ A schema is a process for incorporating new information and adapting existing interpretations of the world.

Four Stages of Development



- Each stage is characterized by specific abilities and limitations
- Transition from one stage to the next is marked by some changes in the child's schema
- Children can progress through the stages at different rates
- Every child must pass through the stages in the same sequential order
- No stages can be skipped

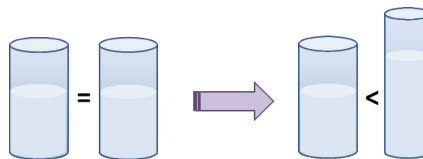
Sensorimotor Stage (0 – 2 years)

- Child begin to recognize that he can affect change on his environment
- Child engages (move around, play with things) with the world and act with intention
- **Object permanence** is learned
 - Realization that objects continue to exist when no longer visible
 - Ex: When parents leave the room, they are just temporarily out of sight

Preoperational Stage (2 – 7 years)

- Object permanence is mastered
- Still need to master egocentrism, seriation, reversible relationships, and conservation
- The preoperational child is **egocentric**
 - He has difficulty understanding the world from a perspective other than his own

- Ex: If I want to play now, surely my mother also wants to play now!
- Demonstrated through Piaget's Three Mountains task
 - Child sees a display of 3 mountains and is asked to choose from a series of pictures what the display would look like from the perspective of someone across the table but they are unable to see the display from the point of view of someone else
- The preoperational child has difficulty with **seriation** tasks or ability to logically order a series of objects
 - Ex: Child will not be able to place 5 sticks in order from shortest to longest
- The preoperational child has difficulty with **reversible relationships**
 - Ex: You ask Rachel if she has a brother named Matthew, she says YES but if you ask Rachel "Does Matthew have a sister?" she may respond NO
- The preoperational child has difficulty with **conservation tasks**
 - In a fluid conservation task, a child would SEE two glasses of milk and understand that they contain exactly the same amount of fluid.
 - If you pour milk from one glass into a taller, narrower glass and ask the child which glass has more fluid and which would you rather have, she will say second glass even though she saw you pour the milk into the taller glass.
 - She doesn't realize that it's only at a higher level because the glass is narrower



Concrete Operational Stage (7 – 12 years)

- Child is able to perform all the things he struggled with in preoperational stage such as egocentrism, seriation, reversible relationships, and conservation.
- Child's schemas are still CONCRETE and based on her experiences with the world
- Child is still unable to think in abstract terms or reason based on hypotheses

Formal Operational Stage (12+ years)

- Children are able to think in abstract terms, work with hypotheses, and do everything else that make up the range of adult cognitive abilities (love, success, freedom, justice)
- Many children develop an interest in fantasy games or books
 - At this stage, they can truly understand the theoretical world in which these games take place

Select the correct order of events, according to Piaget's 4 stages:

- A child points to a picture of a cow and says "moo" -> A child is not surprised to see his mother go into another room and come out from the same room -> A child notices that the sky is getting cloudier and greyer and tells his mom, "I think it's going to rain soon" -> A child knows that to do well on a dictation, they must study their words
- A child is not surprised to see his mother go into another room and come out from the same room -> A child points to a picture of a cow and says "moo" -> A child knows that to do well on a dictation, they must study their words -> A child notices that the sky is getting cloudier and greyer and tells his mom, "I think it's going to rain soon".
- A child points to a picture of a cow and says "moo" -> A child is not surprised to see his mother go into another room and come out from the same room -> A child knows that to do well on a dictation, they must study their words -> A child notices that the sky is getting cloudier and greyer and tells his mom, "I think it's going to rain soon".

Conclusion

- Piaget himself noted the phenomenon of **decalage**
 - Children sometimes develop some skills out of order in the strictest sense of Piaget's theories
- Criticism says that the very tasks that Piaget used to formulate his hypotheses rely heavily on the child's language abilities.
 - Ex: Asking a child which contained has more liquid may be confused with which container is taller as the terms "more" and "less" may be confusing from a language perspective rather than an intelligence development perspective

Module 6 – Biases and Heuristics

Introduction

You often used quick and easy rules to make common decisions quickly and often enough, accurately. However, these rules may also make you subject to errors

Problem #1

Hypothesis

- If card has vowel on one side, it has an even number on the other



It costs \$1 million dollars to flip over a specific card and you only have \$2 million

Confirmation Biases (based on Problem 1)

If you chose to flip over A and 4, you have demonstrated the **Confirmation Bias**

- Our tendency to seek out information that supports our hypothesis

The ideal strategy:

- Choose A to see if it has an even number on the other side
- Choose 7 to see if it has a vowel on the other side
- If the 7 has a vowel on the other side you have disconfirmed your hypothesis.

Confirmation bias feels like the ideal strategy because it helps to amass a wealth of confirming data but it's more important to realize that if evidence against your hypothesis appears, you must revise or discard it.

In a sense, the best way to show that you were right is to look for evidence that you were wrong!

Test hypothesis "everyone who drinks alcohol is over 21 years old"

If you're a bouncer at a bar and only have time to check 2 of these 4 people, you would choose to flip over the "16 years old" and "drinking beer" cards

- By turning these cards, you are looking for disconfirming evidence.



- A physician listens to a patient's description of symptoms, and makes an initial diagnosis. She then asks questions about the patient's symptoms.
- In this process she focused on collecting evidence that might support or CONFIRM her initial diagnosis hypothesis
- By failing to also look for disconfirming evidence, the physician is falling victim to the confirmation bias

Which of the following is not an example of the confirmation bias?

- ☐ After buying a new sweater, you see a similar sweater in a more expensive store and decide that you've gotten a great bargain.
- ☐ Asking a patient if they have the symptoms of one specific illness.
- ☒ In a game of 20 questions, you keep asking questions that eliminate other possible items.
- ☐ Ignoring evidence that contradicts a theory that you are seeking to support.

Problem #2

- Which do you think is more common cause of death worldwide? The total of all motor vehicles accidents or respiratory infection?
 - Most people would say motor vehicles but did you consider countries where motor vehicles are much less common?
- Which do you think is more common cause of death in the US? Gunshot or diabetes?
 - Most people would say gunshot because it's often reported on the news and media but did you consider the extent of kidney and heart failure that can be associated with diabetes?

Availability Heuristic (Based on Problem 2

- These errors in judgment are caused by our reliance on heuristics to make decisions
- **Availability Heuristic**
 - Our tendency to make decisions based on the information that is most quickly available to us (Mental shortcut used to solve a problem quickly and often
- Most lottery winners collect very modest/simple sized prizes, and large jackpot winners are very much the exception. However, big jackpot winners are very well publicized, and so they're more readily available to your memory

- Thinking that a person with a British sounding accent necessarily comes from the UK is another example of availability heuristic

Problem #3

- Steve is quiet, likes to read, and listens to classical music. Is he an English professor or a farmer? Most people report that Steve is an Eng prof given the brief description.
- Why is he more likely to be an Eng prof? Is it because he is quiet? Is it because he likes to read? Is it because he listens to classical music?

Representativeness Heuristic

- The relative proportion of farmers compared to Eng profs is much greater in the general population and so we are more likely to run into a farmer on the train than an Eng prof.
 - Most people believe Steve is an Eng prof because of **representative heuristic**
 - Our tendency to assume match that what we are seeing to a representation of the larger category we have in our mind
 - You assume that every farmer looks like the farmer in your head, and every Eng prof looks like the Eng prof in your head.
 - When deciding what Steve's profession might be, you felt that being quiet and bookish is more representative of an Eng prof than a farmer, and you used the representative heuristic to arrive at a decision
-
- You flip a coin and get the following sequence of heads and tails – H H T H T H T T T T
 - Is the next flip likely to be heads or tails? Most people would say heads without considering that each coin flip is independent of the other as there is an equal chance of landing heads or tails.
 - However, when you look at this coin flip sequence and compare it to the “random 50/50” pattern prototype that you have in your head, you may think that the next coin flip should be heads to match the pattern of randomness (50/50 chance)
-
- Casinos are well aware of the representative heuristic so they have an electronic board listing the running history of numbers that have won at each individual table.
 - This board gives players the illusion that they have useful information by which to base their next bets.
 - An unwise player may think that knowing that the last several rolls have results in an even number may give them an inside edge on betting that an odd number is more likely to hit on the next roll
 - In reality, the chances of an odd number hitting the next spin have not increased at all.

The difference between an availability heuristic and representativeness heuristic is:

- ☐ Availability heuristics are used when we make careful, thoughtful decisions relying on information that's readily available to us; Representativeness heuristics are when we make careful, thoughtful decisions relying on information that's not readily available to us.
- ☐ Availability heuristics are used when we make careful, thoughtful decisions relying on information that's readily available to us; Representativeness heuristics are used to make decisions with information that is representative of a items that are personally relevant to us.
- ☐ Availability heuristics are used to make rapid decisions with information that is representative of a category; Representativeness heuristics are used to make rapid decisions relying on information that's readily available to us.
- ☒ Availability heuristics are used when we make rapid decisions relying on information that's readily available to us; Representativeness heuristics are used to make decisions with information that is representative of a category.

Module7 – Conclusion

- How reliable is the test to measure intelligence?
- Most people assume that fingerprint ID is 100% accurate and reliable but the truth is that there is a lot more noise in this seemingly reliable measure
- Great difficulty in measuring more abstract concept of intelligence