# What is Psychology?

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We will be learning the science of psychology rather than clinical psychology and our goal is to understand the human thought and behavior.

**What does psychology teach us?** Teaches how we think, feel, develop, learn, interact and grow. It also teaches us to use scientific methods to collect and evaluate information and derive a conclusion based upon it. It teaches us not to believe something without solid proof.

## History of Psychology

- Greek words Psyche *(soul)* and logos *(study of)* which means study of soul.
- Psychology is only about 150 years old. Before this, study of mind was philosophy and physiology *(the functions of a organism or any of its parts)*

## Early Century Philosophers influence:

**Greek Philosophers *Aristotle and Plato asked questions:***

- How do we learn to remember?
- Where does knowledge come from?

***René Descartes:***

- Mind and Body were two different entities that worked together.
- The Mind controlled the mechanical movements of the body and received information about the outside world through sense organs.

## 1800 Century Physiologist influence:

***Muller:***

- Different areas of the brain serve different functions.
- Nerves transmit messages in the form of electrical impulses. The impulses travel along different channels
- Particular areas of the body are connected to particular areas of the brain and played a role in different functions.

***Flourens:***

- used Muller's technique to destroy certain areas of an animals brain. By doing so, he studied the particular area's function.
- By using the method, he analyzed which areas controlled heart rate, breathing and processing of visual and auditory reflexes.

***Helmholts:***

- Nerve impulses do not travel at the same speed an electrical current passes through a conductive wire. Nerve impulses travel at about **90 feet/second**.

*Psychology began to emerge out of roots of Philosophy and Physiology.*

## Birth of Psychology (1879):

- Wilhelm Wundt opens first lab devoted to study of psychology. Believed that scientific methods could be used to study conscious experiences.

### *Willhelm Wundt:*

- 1881 Launched first Scientific journal promoting psychological research.

## Introduction to Levels of Analysis

- *Learning, Social Psychology, Cognition, Evolution, Neuroscience, Development*

### *Learning:*

- *Ivan Pavlov* performed an experiment where he gave a dog food and rang a bell each time. The dog **learned** to associate food with the sound of a bell. The bell acted as a **que** for the dog.
- Humans also use such que for digestive processes and various other daily activities. We can use this technique to cure phobias.

### *Structuralism:*

- Focused on breaking down mental processes into their most basic components.
- Researches used introspection (analyze own experiences and reported on them)

### Functionalism:

- focused on the purpose of consciousness and behavior.

### Behaviorism (derived from functionalism):

- John B. Watson (Father of Behaviorism)
- The mind is a black box that takes input and gives output. The processing information is to complex to understand and is "outside the domain of science."
- BF Skinner -> You can learn everything about an organism by simply studying it's behavior. Organism will repeat a behavior if it leads to something pleasant

### *Cognition (1960's):*

- Proper Scientific methods can be used to unlock the black box (the mind)
- Analyzes Thought, Attention, Memory, Language, and Problem Solving
- Models used to explain complex processes. Models raise questions and may become outdated when new data is presented. Thus, a new revised model must be made to explain these changes.
- **Models:** Abstract representations of how the mind functions. Can be used to make testable predictions and design experiments.

### *Neuroscience:*

- early scientists drilled holes into the patients skull to look at the brain.
- X-rays, MRI, CT Scanning
- Neuroimaging through MRI can allow us to non invasively see the brain. **Structural MRI** allows us to see the physical makeup of brain. **Functional MRI** allows us to see what brain is actually doing at the time.
- **Francis Crick:** Where does human Consciousness come from? Why do we behave the way we do?

**Reductionism:**

- All behavior can be linked to the brain. Our understanding of the brain is incomplete.

### *Social Psychology:*

- Influence of individual on a group

- Influence of group on a group
- Influence of group on individual

*Social psychologists have to be aware of Ethical considerations as they may have to cause Distress or Deception to create a social situation.*

***Evolution and Development:***

- Developmental psychologists study the development of behavior over a single lifespan.
- Evolutionary psychologists study the development of behavior over a much larger period of time. Thousands to millions of years.
- When studying subjects such as infants, special techniques must be constructed to understand behavior correctly (infant + pictures).

## CASE STUDY ON DEPRESSION TO FIGURE OUT DIFFERENCES BETWEEN EACH TYPE OF PSYCHOLOGY

***Learning Approach:***

- *What are the behaviors associated with depression and how can they be altered?*
- *They use Therapy to reverse the problem.*

***Cognitive Approach:***

- *What negative thought processes are driving depression?*
- *Therapy to reverse the negative thoughts about ones self.*
- ***Aaron beck:*** *depression is fueled by one's negative thoughts towards self, world, future.*

***Neuroscience Approach:***

- *What changes in the chemical/structural balance of the brain lead to depression?*
- *Potential drug treatment to restore chemical/physical balance*
- *Hippocampus region smaller in individuals suffering from depression.*

***Social Psychologist:***

- *How does a person's relationship affect their depression?*
- *Study the importance of having a support group such as peers or family to fighting depression.*

***Evolutionary/Developmental Psychologist:***

- *What genetic or environmental factors lead to depression?*
- *Why wasn't the depression gene eliminated through evolution?*
- *In a social species, depression may be beneficial as it may lead to a increase in peer support.* ***–Marcello Spenilla***
- *Nature/Nurture argument.*

# Introduction to Scientific Research

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**The Scientific Method:**

- We cannot use sources such as Friends, Media or Personal Experiences
    - Biased information that may not be accurate
- Scientists have a 7 Step method with following Goals:
    - Trying to minimize biases
    - Making sure information is valid
    - Avoiding conflicting information
    - Avoid Overseeing important data
    - Avoid **Confounding Variables**. Variables other than independent variable which may have effect on results.

**The Seven Steps**

- **Theory:** By reading the work of other scientists, we can construct a general set of ideas on how the world works.
- **Hypothesis:** A set of statements that form the basis of the experiment you are conducting. These statements guided by theories make predictions about the relationship between variables.
- **Research Method:** Constructing method by which to test the hypothesis. (Hardest Part)
- **Collecting Data:** Taking measurements of the outcomes of the test. (Avoid Bias)
- **Analyze Data:** understand the data collected and discover trends/relationships between variables.
- **Report Findings:** findings are published in scholarly journals after rigorous review. The journals are also tested by the scientific committee for accuracy.
- **Revise theories:** Preexisting theories about the world may be modified to include new research. (Fix what the reviewers tell you to do. Usually reviewers find flaws with findings and we must fix them)

**Conducting an Experiment**

Experiment is a scientific tool used to measure the effect of one variable on another.

- **Testing a Hypothesis:**
  - **Anecdotal evidence:** Evidence gathered from others or self experience.
    - Cannot be used to conduct scientific experiment
    - Your experiences may not be the same as what others in the larger population may have experienced
    - Your personal experience does not represent the experience of others in the same conditions
    - Other factors may have played a role in influencing your experience.

- **Using the Experiment**
  - An experiment is a scientific tool used to measure the effect of one variable on another
  - **Independent variable:** the variable manipulated by the scientist.
  - **Dependent Variable:** the variable that is being studied and is not under control by scientist.

**Control Groups**

- Introducing a subject that is not under the influence of the independent variable.
- This subject must have a similar behavior to the subject being tested. For example, is test marks under the influence of caffeine was the research topic, both subjects should be equally motivated and have the same level of intelligence.

  **Using Control Groups**
  - We should have more than one participant in each condition. The experimental subject may possess superior/inferior abilities than that of the control subject.

- **Experimental group** receives the manipulation of the independent variable. The **Control group** does not receive independent variable.
- As discussed before, participants in both groups should be as similar as possible in ability, intelligence and other aspects.

**Participant Designs**

- **Within-Subject Design:** A single participant acts as both the control and the experimental group. He performs some tests using the independent variable, and then performs other tests without using the variable.
- **Expensive and Time consuming**
- **Practice Effect:** Experience leads to better performance over course of experiment.
- ***Subject being tested may be bias and perform better on purpose for the experimental test?***

**Between Subject Designs**

- One group of subjects is the experimental group whilst the other is the control group
- Once again, subjects should be similar as possible in every way

**Sampling**

- **Population:** The general group of people we are trying to learn about. For example, the effects of caffeine on **undergraduate students.**
- **Random Sample:** Our test subjects should be randomly chosen from this general group of population to represent a majority or group without bias towards one.
- **Sample:** The chosen participants of the population who we conduct tests on. **DO NOT PICK A TOO SPECIFIC SAMPLE GROUP** as this will not present the general population.
- **Random Assortment:** Assign subjects to the experimental/control group on random to avoid any biases towards a group of subjects.

**Conducting an Experiment**

- **Subject Biases**
  - **Placebo Effect:** the experimental group should not know that they are influenced by the independent variable. The placebo effect may occur, in which individuals respond to a treatment that has no medical effect. The experimental group may think that they are being given the miracle drug, will be motivate and perform better for other reasons than the drug itself.
    - **Do not tell participants whether they are in experimental or control group!**
  - **Participant bias:** participants actions in experiment influence results outside the manipulations of the experimenter.
  - **Blinding:** When participants do not know whether they are in experimental or control group or which treatment they are receiving.

- **Experimenter Biases**
  - Actions made by the experimenter unintentionally or deliberately, to promote the result they hope to achieve
  - **Don't even tell the experimental which group do the sample belong to!**
  - **Double Blind studies:** Neither the experimenter or sample know which group they belong to.

# Descriptive Statistics

## Working with Raw Data

- Statistics allow for analyzing, summarization, and interpretation of data collected.

## Types of Descriptive Statistics

- Descriptive statistics allow us to view data information at a glance and gives us an overall idea of the results of the experiment.

## Using Histograms

- A **Histogram** is a type of graph that is used to report the number of times a group of value occurs in a data set. On the x-axis of such a graph is the group of values, whilst on the y-axis is the frequency that dataset occurs.

## Frequency distribution

- Type of graph illustrating the distribution of how frequent values appear in the data set.

## Normal Distribution

- Distribution with a characteristic of Smooth, Bell and symmetrical-shaped curve around a single peak.
- Things such as IQ and test scores fall under this typical pattern.

## Measure of Central Tendency

- **Mean:** The most commonly used. It is found by averaging the data set. It can be misleading when a **outlier** is present in the system. The value for the mean can drop/increase dramatically depending on outliers which are **extreme points** distant from others in the data set.
- **Median:** The median is the centre value in an organized data set. It tells us what the middle point of our data is without influence of outliers.

- **Mode:** Appears most frequently in the set and tells us what the most typical response was. It is the only method out of the 3 discussed that can be applied to something outside of numerical figures.

**Measures of Variability**

- **Standard deviation:** tells us how spread out the data figures are. The higher the standard deviation, the more spread out the graph is. The lower the standard deviation, the less spread out.
- The standard deviation of a dataset is essentially the average distance of each data point from the mean.

**Inferential Statistics**

- The resulting dataset from the experimental group and the control group must vary to a degree before we can conclude that the independent variable had an effect.
- If the experimental and control group perform only slightly different, perhaps the independent variable had no effect. It may have been by random chance that one group may have performed better.
- **Inferential Statistics:** Statistics that allow us to use results from samples to make inferences about overall, underlying populations.

**Hypothesis Testing**

- **Alternate Populations**
  - In a experiment, we are trying to represent the results of a few individuals to hypothesize the effect of the independent variable on an entire population.
  - The **Control group** and an **Experimental group** may be classified as two different populations. One population represents people under the influence of the independent variable, whilst the other population represents people who are not under the influence of the independent variable. This is referred to as **alternate populations**.

- **If the independent variable has no effect, both groups represent a common population.**

- **T-test**
  - Compares each data point from the experimental and control group to calculate the probability of getting results by chance.
  - Is the difference between my control and experimental group large enough to conclude that the independent variable may have had an effect?

- **P-Value**
  - A value expressing the probability calculated by the t-test
  - **The p-value must be less than 0.05 to conclude that independent variable had an influence**
  - A p-value of less than 5% means that the probability of receiving results by chance is unlikely
  - **Statistically significant → P-value less than 0.05**

- **Statistical Significance**
  - Difference between 2 groups is due to some true difference between the properties of the 2 groups and not random variation
  - The different results obtained are not a result of random chance

**Observational Research**

- **Introduction to Observational Research**
  - Used for studies that may have ethical concern
  - **Scientists observe the effect of variables of interest on subjects without actually performing any manipulation**
  - Example: Rather than asking subjects to start smoking to study lung cancer, a scientist may use data collected on cancer vs smoking from existing smokers (experimental group) and non smokers (control group)

- **Correlation**
  - Measure of Strength of the relationship between 2 variables
  - **Correlation Coefficient:** Symbolized by letter **R** it represents the degree with which 2 variables are correlated.
  - **+1 coefficient:** variables are perfectly positively correlated.
  - **-1 coefficient:** variables are perfectly negatively correlated.
  - **0 coefficient:** As relation between variables get weaker, coefficient correlation approaches zero

- **Correlation is not Causation**
  - The relationship between two variables does not always prove the hypothesis
  - **An external factor or confounding variable may be the cause of the correlation of two variables.**
  - For example: ice cream and allergies may be correlated but pollen in the air during hotter months when ice cream is eaten is the true reason for this pattern.

**Introduction to Learning:**

**Two Types of Learning**

- **Classical Conditioning:** Allows us to associate two different events. An organism is able to respond to a signal (stimuli) before a event occurs. For example, a dog presented with a conditional stimuli may salivate even before he is given food. In nature this event produced positive outcomes. For example, salivating may make digestive processes easier.
- **Instrumental Conditioning:** Allows us to associate actions with consequences.

**Classical Conditioning**

- Invented by **Ivan Pavlov** also known as Pavlovian Conditioning
- Pavlov discovered that organisms can learn to associate different stimuli to different events and produce a conditional response.
- Tested hypothesis on dogs by presenting a conditional stimulus in the form of a metronome. Every time the metronome was activated, the dog was presented with food. Eventually, the dog learned to associate the rhythm of the metronome with food and salivated even when no food was presented.
- **Contingencies** form when a animal learns to associate a signal to a specific event.

**Terminology**

- **Unconditional Stimulus:** Naturally/Automatically triggers a response without any learning required.
- **Unconditional Response:** The response that naturally occurs when a unconditional Stimulus is presented. For example, salivating when food is presented is a unconditional response generated by the body. It is Biologically programmed.
- **Conditional Stimulus:** A stimulus usually paired with the unconditional stimulus. At the beginning, the stimulus is neutral and has no effect. However, through learning we learn to associate a conditional response when presented with a conditional stimulus. The conditional response may be similar to the unconditional response.

    - The conditional Stimulus must be presented before Unconditional stimuli. Repeated trials of training must be preformed where the CS and US are paired before the CS can generate a response on it's own.
- **Conditioned Response:** A response generated by the Conditional Stimulus.

**Acquisition**

- **Acquisition** is the process by which a contingency between a CS and US is learned. In other words, it is the rate at which a subject learns to associate conditional stimulus with a unconditional stimulus and thus produce a response.
- When conditional stimuli is being learned through repeated trials, evidence shows that a significant amount of learning takes place during the first initial trial. Although some learning occurs during the additional trials, it is not as great as what occurred during the initial trial.
- **Some contingencies can be formed in a single trial.** For example, a rat learns to associate a certain food and sickness in a single trial. For the rest of it's life it will avoid the food.
    - **CS = Taste  US = Sickness  CR/UR = Aversion**
    - The specific taste of the food is permanently associated with aversion, regardless of whether sickness may occur.

**Extinction**

- **How long do the effects of a learning trial last?**
    - As long as the Conditional stimuli proves to be a reliable queue to the Unconditional stimuli, the contingency will be maintained. If the Conditional stimuli no longer accurately queues the Unconditional stimuli, the contingency between the two will fade.
- **Extinction:** The loss of the Conditional Response when the Conditional Stimuli no longer accurately predicts the Unconditional stimuli.

- If we present the conditioned stimuli multiple times without the presence of the unconditional stimuli, eventually the subject will no longer display a response to the conditioned stimuli.

**Inhibition**

- When extinction occurs, the subject does not unlearn the association between the conditioned stimuli and the unconditional stimuli. Rather, a inhibitory response is learned that contradicts with the contingency present between the conditioned/unconditioned stimuli.
- After a period of rest, the presentation of a conditioned stimuli will once again trigger a conditional response, proving that the original CS US association is not unlearned.

**Generalization and Discrimination**

- **Stimulus Generalization:** Stimuli that are similar to the learned conditioned stimulus will also produce a conditioned response.
    - For example, we may have been bitten by a specific breed of dog and may have learned to associate that breed with the unconditioned stimulus of Dog bite. This means that every time we see that breed of dog, we will produce a response.
    - However, when we are presented to other breeds of dogs, we will still produce a response even if that breed has never bit us.

- **The Generalization Gradient**
    - An individual has been conditioned to associate 500hz tone with electrical shock and thus the conditioned response of expecting pain.
    - As we move away from the 500hz tone either by increasing/decreasing the frequency, we can see that the conditioned response is still present but varying.
    - Frequencies near the 500hz mark produce a strong response similar conditioned response. Frequencies further away from 500hz produce a weaker conditioned response.
    - When charting the level of response (y-axis) vs. Frequency tone (x-axis), the highest point is at 500hz and the graph decreases as we move farther away.
    - **Stimulus similar to the conditioned stimulus produce a higher level of conditioned response than those that are not similar. (50hz < 450hz)**

- **Generalization and Extinction**
    - We can diminish the conditioned response to a conditioned stimuli by repeatedly presenting a subject with the conditioned stimulus without presenting the unconditioned stimulus. (For example, present a dog without the dog bite)
    - When this occurs, the entire Generalized gradient is effected and the strength of the Conditioned response is weakened as a result. (Scared feelings towards dogs weakened)

- **Discrimination Training**
  - Restricts the range of Conditioned Stimuli that may invoke a Conditioned Response
  - For example, we may restrict the conditioned response towards a certain breed of dog by continuously showing a picture of it.
  - **Unlike Extinction, the rest of the generalization gradient remains intact. Discrimination just narrows down the conditional stimuli that invoke the conditional response.**

- **CS+ and the CS-**
  - **Through discrimination training, we can shape the level of conditioned response generated in a generalized conditioned stimuli. We can completely remove the level of conditioned response towards a certain portion of a generalized stimuli.**
  - **CS+** refers to the portion of a generalized conditioned stimuli that predicts the presence of the unconditioned stimuli and produced a response.
  - **CS-** refers to the portion of a generalized conditioned stimuli that predicts the absence of the unconditioned stimuli. This is typically the portion which produces zero conditioned response after discrimination training
    - **For example** the 500hz (CS+) sound is followed by the unconditional stimulus of shock while the 600hz (CS-) stimuli is followed by nothing. After discrimination testing, the subject will not react to the 600hz stimuli while they will react to all the other generalizations of the conditioned stimuli (ranging from 0hz-580hz)
    - **CS 600hz → US None → UR/CR NONE**
      **CS 500hz → US Shock → US/CR Fear of Shock**

**Phobias and Therapies**

**Conditioning and Fear**

- **Phobia:** Fear of certain situations, things, activities or people.
- **Treating of Phobias:** Present the conditioned stimulus repeatedly without presenting the unconditioned stimulus. This will fade the conditioned response over time.
    - For example, present the subject snakes (conditioned stimulus) without the snake bite (unconditioned stimulus) in order prevent Fear or snakes (conditioned response).
    - This can be difficult as the subject will most likely want to avoid facing their phobia.
- **Implosive Therapy:** subject must confront the phobia in order to suppress conditional response. The conditioned stimulus is presented without the unconditioned stimulus.
- **Systematic Desensitization:** Uses the generalization gradient in order to combat a phobia.
    - conditioned stimulus that occurs at the far end of the curve are extinguished before moving onto the major stimuli that occur near the middle.
    - A subject with a fear of dirt might be exposed to paper confetti and other items before being exposed to dirt.

**Homeostasis and Compensatory Responses**

- Our body also learns to create conditioned stimuli based on previous experience.
- For example, coca-cola increases blood-sugar level which in turn requires insulin to be released. Therefore, the body learns to recognize the sweet taste of cola and produces a conditioned response of releasing insulin automatically, regardless of whether the cola contained sugar or not.
- Our body uses **Classical conditioning** in order to prepare the body for challenges to homeostasis.

**Addictions**

- Environmental queues play a role in promoting drug intake.
- When drug intake occurs, the body counters the effect of the drug in order to maintain homeostasis. These effects include increase of

pain sensitivity and respiration and become the **Unconditioned Responses to the drug**.

- Drug intake usually occurs at a particular period of the day, at a certain location, under a certain mood. The body learns to associate these environmental factors and turns them into a **Conditioned Stimuli.**
- When the subject is present in such environment, the body automatically initiates processes that promote homeostasis, regardless of whether the subject has taken the drug or not. The body has learned that the environment conditions usually result in drug intake and performs homeostatic activities to counter the drug effects. This body has created **Conditioned Response.**
- **This is why addicted individuals tend to crave a certain drugs only when present in a certain environment. Their bodies are initiating processes that have the opposite effect of what the drug had.**

**Withdrawal and Environmental Specification**

- As an individual increases his intake of a drug in a specific familiar environment, his **tolerance (CR)** towards the drug builds up and the effect of the drug weakens.
    - **Exposure to Drug taking Environment (CS) produced a counter-adaptation effect (CR) which generates desire to take drugs**

**Overdose**

- Usually occurs when drug users intake a type of drug in a new environment.
- When taking drug in a new environment, no conditioned response occurs as the body has no conditioned stimuli. Therefore, only natural unconditioned processes act on the body and no built up tolerance is present. This increases the risk of overdose.

**Instrumental Conditioning:** Involves explicit training between voluntary behaviour and their consequences. It is not naturally formed contingency unlike the ones found in Classical Conditioning examples. **Learning the contingency between behaviour and consequences.**

**Thorndike's Experiment (puzzle box)**

- Placed cat in a box with a door which could be opened by pulling a string
- The cat must open door in order to reach food outside the box (motivator)
- The action of pulling on rope must be learned through many attempts
- Each attempt, the time it takes vs the number of trials decreases gradually.
- Random behaviour that did not lead to escape occurred less and less.
- The POSITIVE BEHAVIOUR was motivated, whilst negative was inhibited.
- Animals = No consciousness applied to behaviour unlike humans.

**The Law of Effect**

**Stamped in:**

-Thorndike experiment, behaviour like rope pulling stamped in
- Stamped in behaviour produces a favourable consequence.

**Stamped Out:**

- Behaviour that do not produce a favourable consequence.
- These behaviour are typically eliminated through learning.
- Animal will learn to favour the stamped in behaviour over this.

Eventually, the cat will form a contingency between pulling rope and reward.

**The Law of Effect:**

- Behaviours with positive consequences will be stamped in
- Behaviours with negative consequences will be stamped out.

## Types of Instrumental Conditioning

### Four Consequences

- **Reinforcer:** Any stimulus presented after a response.
- **Positive Reinforcers** may promote a certain response.
- **Negative Reinforcer** may inhibit a certain response.
- Presenting/Removing positive and negative reinforcer modifies behaviour

### Reward Training

- Presentation of positive reinforcer
- Increases a certain behaviour
- Presenting puppy with treat every time it sits on command will increase behaviour

### Punishment

- Presentation of a Negative reinforcer
- Leads to a decrease in behaviour
- Punishment by parents decreases unwanted behaviour
- Controversial due to ethical implications
- B.F. Skinner: **When punishment is used, authority figure may become signal for pain.**

### Omission Training

- Removing a positive reinforcer
- Decrease in a certain behaviour as a response
- Removing positive reinforcer is a situation a person wants to avoid
- Example. Time out in kindergarten. All the other kids can play but you can't.

### Escape Training

- Removal of negative reinforcer
- Constant negative reinforcer presented that the learner wants to remove.
- Increase in the Target Behaviour.

The response must be presented soon after the behaviour is performed. If the response is presented later, contingency may not form between behaviour and response may not form.

**Acquisition and Shaping**

- **Contingencies:** Learns between a stimulus and a biologically important event
- **instrumental:** Contingency between a response and consequences.

**Graphing Responses**

- Response rate for a new behaviour.
- Accumulive Recorder --> Like a lie detector
- Graphing responses: X-axis (time), Y-axis ( # of Responses per Trial)

**Autoshaping**

- The subject learned the contingency between behaviour and response by itself.
- Example: Pigeon will learn to peck keyhole in order to get a grain of seed.
- Behaviour and Response learned without explicit training by researcher

**Shaping**

- Complex behaviour and responses cannot be effectively auto-learned.
- Shaping takes a complex behaviour, splits it into components and then through reward training builds up to the final complex behaviour
- B.F. Skinner --> Pigeons playing ping

## Generalization and Discrimination

### The discriminative Stimulus

- The discriminative stimulus tells the subject when a certain contingency is present between a response and it's reinforcement.
- **For example, a particular environment or person may signal the activation of a certain behaviour in order to receive a particular response. The Discriminate stimulus is the environment/person.**
- S-Delta is a queue that indicates when a contingency between the conditioned stimulus and response is not valid to obtain a reinforcement.
- Unlike a conditioned stimulus, which autonomously produces a conditioned response through reflex, the discriminative stimulus simply sets the occasion when a response is valid and likely to generate a positive reinforcement. The response is typically voluntary by the subject.

### Generalization

- Like in classical conditioning, the subject may react to stimulus that is similar to the discriminative stimulus.
- The closer in resemblance the discriminative stimulus is, the higher the rate of response. The further the resemblance of discriminative stimulus, the lower the rate of response.
- In the presence of adults that resemble a child's parents, the child may behave more politely in order to get praise.
    - **Adults: Discriminative stimulus**
    - **Politeness: Response**
    - **Praise: Reinforcement**

### Discrimination and Extinction

- **Discriminative Stimulus Extinction**
    - If the Discriminative stimulus is present and generates a response but, the response does not generate a positive reinforcement, the subject will unlearn the

contingency between a DS and a response and will not display a certain behaviour.

- **Generalization Extinction**
  - Stimulus that appear to be similar to the Discriminative stimulus do not present positive reinforcement to a generated response in behaviour. Eventually the subject will learn to disassociate the generalized stimulus and not perform a particular response.
  - The response will only be generated in this case when the exact Discriminative stimulus is present.

**SD and S-Delta**

- Experiments conducted with S-Delta and SD produce more effective results that can be analyzed by a generalization gradient.

**Schedules of Reinforcement**

- **Continuous vs. Partial Reinforcement**
  - Continuous reinforcement occurs when a response leads to a reinforcement on every single occasion. This is generally rare in the real world.
  - Partial Reinforcement schedule is one where a particular response does not always initiate a reinforcement.
- **Fixed Ratio vs. Interval Partial Reinforcement**
  - **Ratio Responses:** reinforcement given based on the number of trials made by the subject.
    - FR1 Reinforcement = each response initiates a reinforcement. FR10 = every $10^{th}$ response initiates a reinforcement.
  - **Interval Time:** This type of schedule presents the subject with a reinforcement after a certain set period of time since the last response was reinforced.
    - FR1minute = reinforcement after every response initiated after 1 minute period. FR10minute = reinforcement after 10 minute response.
- **Fixed Constant vs. Variable**

        - Random Reinforcement based on some sort of a mean.
        - For example, on a VI10 schedule, although the time when reinforcement is given are random, the average time between response and reinforcement will be 10 minutes.
    - **Fixed Ratio**
        - A schedule with a very high FR may result in a loss of response
        - Cumulative Record: Time (x-axis), # of responses per trial (y-axis)
        - **Following reinforcement, a subject will pause with inactivity before once again responding.**
        - The pause with inactivity may be a result of the subject lacking motivation to performing a response.
    - **Variable Ratio**
        - Reinforcements are made on a random response basis around a average figure.
        - The Lower the Variable ratio, the higher the rate of response and thus the larger the slope between # of responses and Time.
    - **Variable Interval**
        - Reinforcement is delivered on a random time basis around a average figure.
        - For example, a machine may have a VI of 10. This means that the average of all the responses by a subject in which reinforcement was present must equal to 10.

**Extinction and Schedule**

- Partial reinforced behaviour is less prone to extinction than continuous reinforced behaviour.
- When continuous reinforcement stops, the subject immediately realizes of this abrupt change and will decrease responding
- In a partial reinforcement schedule, abrupt changes take a while for a subject to realize.

- **Partial Reinforcement better option if we want a behaviour to be maintained.**

**Introduction to Memory**

- Thoughts, representations, mental processes make up cognition
- Cognitive factors provide qualities which allow humans to be classified as humans.
- **What is memory?**
    - The fundamental process which allows us to store and recall information.
    - Memory is a result of complex processes.
- **Common Memory Metaphors**
    - **NOT ACCURATE REPRESENTATIONS OF HUMAN MEMORY.** They can be misleading in various ways.
        - **Video Camera**
            - Memory may be classified using a video-camera analogy. We store information in a medium and replay it at a later moment in time
            - Accurately preserves moments to be played back at a later time
        - **Filing Cabinet**
            - We store information and organize it to be accessed at a later time.
        - **Computer Metaphor of memory**
            - RAM (Random Access Memory) = Short term memory
            - Hard Disk = Long term memory
            - Specialized components responsible for handling memory at different times.
- **Problems with memory Metaphors**
    - **Video Camera**
        - The memory captured through the video camera remains the same. This type of memory does not change and is Vivid and accurate despite the amount of time in past.
        - Human memory is varying and certain moments may become vague or disappear entirely. Also, memories may vary depending on the interpretation made by individuals and personal details.

**Studying memory through scientific means**

- The Questions we must ask:
  - How does memory acquisition function?
  - How are we able to store memory?
  - How are we able to retrieve memory from the system?
- **The importance of Cues**
  - We can navigate through the vast array of memory stored in our brain with relative effortlessness.
  - Environmental cues, social cues and other factors may spark the recall of a particular memory.
    - For example, during conversations we recall various moments that may be buried deep in the mind. In this case, one memory acts as a cue to trigger another memory.
  - Early memory interpreters of memory relied on the **Behaviorist** theory in order to test memory functions. These individuals nevertheless studied the relationship between cues and encoding and retrieval mechanisms.
- **Hermann Ebbinghaus**
  - Memory is a serial learning task.
  - Each word in a word list served as a cue to trigger the recall of the consequent word which followed. Each word in a list connected to a word before and after it.
  - **The experiment:**
    - Exposed himself to a list of random words with no meanings. During the **encoding phase** he tried to memorize the words. During the **recall phase** he tried to recall the list of words.
    - Used nonsense words to minimize the affect of learning the words due to prior experiences and other factors.
    - **How long could memories be maintained?**
      - Number of remembered words plotted against a time graph.
      - Highest # of words at beginning, fewer and fewer words near the end. **The forgetting curve.**

**Testing memory theories using scientific models**

- Cognitive models are generated in order to explain complex functions like memory.
- Models organize and describe data and make testable predictions that can be studied in the controlled settings of the lab.
- **Phases of cognitive model**
    - **Encoding phase**
        - A subject is exposed to a list of items, words, pictures. The control group is distracted while exposed to this list. The test group is focused and is told to learn the list of words.
    - **Retrieval phase**
        - Subjects asked to recall the presented information from the encoding phase.
    - **Recall test**
        - Subject asked to freely recall as many items of the list as they could remember.
    - **Recognition test**
        - Ask the subject to identify whether the item is new and not presented in the encoding phase, or whether it was old and presented during the encoding phase.
    - Both the Recall and Recognition methods test the ability to remember items from the encoding phase

**Popular memory models**

- **The multi-store model**
    - Memory is composed of short and long-term storage systems
    - New information is initially stored in a **short term memory buffer** (similar to RAM in computer).
    - The **long term memory system** can store memories transferred from the short term buffer (Similar to transfer of data from RAM to Hard disk Log files).
    - Rehearsal may influence memory transfer from short-tem to long-term.

- **George Miller**
    - Short term memory has typical **capacity** of 7 +- 2 items.
        - This is why phone numbers are 7 digits long!
    - Short term memory fades as soon as rehearsal of info stops.
    - **Chunking**
        - We may be override the capacity of 7+-2 items by reorganizing information into meaningful packets or "chunks."
        - For example, letter groupings that form words pack a large amount of information without straining short-term memory
- Models have a strong ability to make testable predictions about how memory functions.
- If short term and long term memory are distinct, we should be able to manipulate variables and observe the effect produced on each system

**The Serial Position Curve**

- When a recall test is performed, a common trend shows that memory performance is better for items early and later in the list.
- **Primacy**
    - Memory performance is good for items encoded earlier in the list.
    - In relation to **Multi-store model**, the items at the beginning of the list have most opportunity to be rehearsed. These items may have the best potential to enter long-term memory and be permanently stored.
        - This can explain why memory performance for these items is stellar.
    - Items at the middle of the list have less opportunity for rehearsal. Items at the end of the list are the most recent and are present in the current short term memory. This can explain why their recall rate is high.
- **Recency effect**
    - Last 7 items remain in the short-term memory. This results in their performance.

- **Improving Primacy**
    - If the primacy effect depends on our ability to rehearse, then we should see a change in the primacy effect by influencing this ability.
    - For example, the primacy effect should change depending on the interval of time given to practice the list of words. Reducing the amount of time given to memorize a list of words would decrease the rehearsal level and reduce primacy.
- **Diminishing Recency**
    - Disruption after the encoding stage should effect the recency significantly. Disruptions would affect the content of the short term memory storage.

**Levels of Processing**

- The levels at which items are encoded has a direct effect on the ability to recall them.
    - **Shallow Level**
        - Items encoded at this level require little effort and is often directed at the physical characteristics of a stimulus.
            - Is the word capitalized?
        - Memory performance is poor
    - **Deeper Level**
        - More effort given in order to memorize the item. A great deal of semantic (meaning based characteristics).
            - Does this word fit into the sentence, I walked my _____?
        - Memory performance is much better.
- **Levels of processing principle**
    - The more we try to understand and organize material, the better we remember it.

**Storage and Retrieval related**

- Memories in reality are not simple lists of items but are richly detailed and in context with the world around us.
- Environmental cues are incorporated in addition to learned items.

**Encoding specificity**

- Memory encodes all aspects of specific experiences
- For example, when we encode a word in a memory experiment, we encode various aspects such as:
    - The properties of the room
    - The chair that you're sitting on
    - The font-type
- When recalling a item in the future, the items mentioned above can act as cues.

**Loftus and False Memories (Tricking people into believing memory)**

- **Elizabeth Loftus and false memories experiments**
    - Subjects presented to 4 experiences. 3 were real whilst the fourth was fake.
        - The fake memory was made up by the experimenter and was described in great detail.
    - On the first interview, all subjects identified fake experience as fake.
    - By the third interview however, the fake experience was classified as real by over 20% of the subjects.
    - **Shows that MEMORY IS HIGHLY CONSTRUCTIVE.**
- **False memory implantations (Bizarre fake memories)**
    - Could people be tricked into believing a bizarre and fake memory?
    - **Repeatedly imagining → False memory generation**
    - Memory can be tricked into believing bizarre events.

**Memory and it's flaws (Attributive view of Memory)**

- Memory is a **Reconstructive** process
- Memory is a open interpretation of a event altered suggestions

**Fluency**

- The ease with which a experience is processed
- Familiar processes are processed more fluently than non-familiar processes.

- A sense of familiarity increases fluency and the ease by which we may recall an event.

**Attribution**

- Ties together causes with effects. Fluency must be present in order to create a attribution.

**Memory Illusions** (modification of attribution of fluency and effect on memory)

- **Being Famous Overnight**
  - Individuals were made to read a list of names. Next, the individuals waited 24 hours and were told to identify famous names from a new list presented.
  - The individuals interpreted the names from the list before and interpreted them famous names. Group A, which did not have the delay did not do this.
  - False Fame Effect:
    - Old fictional names create a processing fluency.
    - Immediate test group do not produce fluency associated with names presented. Overnight test group developed a fluency for the names.

**Memories are not necessarily something we store and recall in a system, memories are reconstructed upon demand. We actively construct memories.**

- The memory system is a pile of basic building blocks
- Memory system able to construct experiences that may have not occurred

**Introduction to attention**

- Attention allows one to navigate through a world filled with information.
- Without being able to focus a limited amount of our resources, we would not be able to perform simple tasks such as converse with others, enjoy a piece of music, understand a joke or learn new things.

**Attention**

- We need to identify what Attention is, Build a cognitive model which we can use to test our theories, and explain the hypothesis
- Unfortunately, Attention covers a area of a wide range of topics. We cannot simply generate one theory or hypothesis in order to explain it. **NO SINGLE DEFINITION FOR ATTENTION.**
- **Our conscious ability to attend to something that is relative to our goals.**
- **William James**
    - Attention implies withdrawal from some things in order to deal effectively with others.

**Selection**

- Attending something (focusing) causes the object tot be inattentive to other objects in the surrounding.
- We may be attentive of something at first but may become inattentive if more important stimuli are present during a time.
- Some stimuli have a stronger grasp towards our attention than others do.
- **Irrelevant background information makes it increasingly difficult to attend and identify the important information.**
    - We usually turn radio down when we are driving and need to make important decisions. The radio creates a background noise that needs to be minimized.

**Automatic and Controlled Attention**

**Automatic process**

- Involuntary attention

    - Something that automatically grasps your attention.
    - Fast, efficient manner and grab attention
    - **Some ques are more noticeable and lead to stronger and quicker association when paired with events.**
        - **SALIENT information is anything that naturally pops out at us.**
    - Autonomic processes influenced by learning. For example, we learn to drive a car almost autonomously and regulate various different functions (clutch, accelerator, brake) without specifically attending to them.

- **Controlled process**
    - Conscious attention
    - We may decide whether to pay attention to or ignore. Usually slow due to more cognitive effort required.

**The spotlight model**

- Our attention spotlight focuses on only part of the environment at a time.
- Attention can be directed across a visual scene. This occurs when we are looking for a particular person in a crowd of people.

**Spatial Cueing Paradigm**

- Three squares present on the screen.
- One of these squares is highlighted. Shortly after, one of the three squares is filled in.
- Researchers found that when the highlighted square is the one which is also filled in, the response time is faster than when the highlighted square differs from the square that was filled in.
- The highlighted box is quick due to it's use of automatic process. The Consciously controlled is slower.
- THE QUE AUTOMATICALLY ATTRACTS SPOTLIGHT to the location. If the target is displayed in the que, the perception is amplified and the response is quick. If the target appears in the unqued location,

the target is acquired more slowly because the attention spotlight was towards the automatic location.
- **Attention moves faster than the eye**. We may be attentive towards something even before we see it.

**Filter Models**

- At situations such as parties, there may be a lot of background noise competing for attention. Despite this, we are able to single out a specific noise to focus our attention towards.
- **Collin Sherry: cocktail party effect**
    - Subjects exposed to 2 speakers, both producing a different message
    - Subjects told to focus on one message over the other.
    - **Gender, pitch of speech and various other factors effect ability to filter.**

**Difference between Filter and spotlight model**

- The Filter model assumes that we tune out everything besides the object of focus.
- The spotlight model suggests that the point of focus is enhanced and thus our focus is leans toward that point.

**Broadbent's single filter model**

- The attention filter selects sensory information on the characteristics of physical basis.
- This information is further processed.
- Information that does not pass through the initial filter is irrelevant and is completely voided from further analysis.
- **Broadbent's test:**
    - Dual speakers, each displaying a different message.
    - Subject told to focus to message being relayed by only one of the speakers.
    - The subject has no problem recalling data from the ear which was attentive.
    - Subject seems to completely ignore the message from the opposite ear.

    - **According to Broadbent, the attentive ear is the only one which allows information to enter and undergo deeper processing. The information from the inattentive ear is discarded.**
- **Von Wright.**
    - A stimulus was presented each time a certain word was relayed during a conditoning paradigm.
    - When the word was presented in the unattended ear after conditioning, a response was generated. This showed that the information from the unconditioned ear was also processed.
    - Some information about sound and meaning is able to pass through the initial filter.

**Triesman's Dual Filter Model**

- In contrast to Broadbent's test, the Triesman's model proposes two filters, one filters physical things, whilst the other filters Symantic things.
- Information first passes through physical filter
- Semantic filter evaluates information for meaning. What is the deeper meaning and relevance of the stimuli?

**Shadowing Paradigm:**

- Participant receives an input in one ear completely opposite to the input received in the other ear.

**The Stroop Task:**

- Subjects presented to a colored word and asked to name the color of the ink used to present the word.
- **Congruent items:**
    - Matching word and color dimensions.
- **Incongruent items:**
    - Mismatch between word and color dimensions.
- Performance much faster for congruent than incongruent items.
- The difference in performance between incongruent and congruent trials serve as a empirical measure of processes involved in attention.

**Controlling the Stroop effect:**

- Changing the ratio of congruent to incongruent stimuli.
- A greater number of congruent vs incongruent increases the level of stroop effect. A lower level of stoop effect present when the congruent ratio less than incongruent.
    - The higher congruent ratio leads to a learnt behaviour where the color of the word matches the ink used to produce the color. Therefore, performance on incongruent trials decreases dramatically.
    - If the incongruent level is higher than the congruent, we learn to disassociate ink color to the word color almost entirely. This causes a increase in performance.
    - **Word reading** is a automatic process. It occurs even in the absence of voluntary intention to read a word.
        - **People can control the automatic process as seen by the stroop effect modulation.**
- Allows us to measure both **Automatic** and **Controlled** process influence measured.

**Visual Search**

- Subjects look for **target** in a **array of distracters**
- **Increasing the distracters** and the **number of items to search through** increases the time it takes to find a target.
- **Set-size effect:** Increasing the number of items to find the target from.

**Feature and Conjunction search**

- Color and structural features that distinguish the target from the distracters
- **Pop-out effect:** Rapid visualization regardless of set size. The color is responsible for the pop-out effect.
- **Mixing features** between the target and the distracters makes identification increasingly difficult.
- **Set-size effect:** Size of distracters

- **Feature search:** The feature that separates distracters from target.
- **Conjunction search:** Mixed field where the features may be mixed.

**Contextual Cueing**

- Narrowing down the area where we may find a target.
- **Looking at probable locations where the target may be.**

**Language**

- Language the most complex form of communication
- Form of human communication

**Natural Language**

- Language is **regular** and is governed by rules and grammar. A reorganized sentence can still retain it's meaning.
- Language is **Arbitrary**. The sounds of words do not reference to the object they are talking about.
- Language is **Productive**. There are limitless ways to combine words in order to describe objects, situations and places. This is seen by analyzing infants who experiment with words in order to convey a message.

**The Whorf-Sapir Hypothesis**

- Our thoughts are highly influenced by the native language we speak in. When thinking about a topic, we often converse with ourselves in our native language.
- Language may influence how we perceive and experience the world.
- This can be seen through analyzing the **Piraha tribe**
    - Piraha language only contains numbers 1, 2 and many.
    - The Piraha tribe has trouble recalling groups of objects that were greater than two. Groups greater than two resulted in a decrease of performance. The tribe members were limited by their language.
- **The theory can be countered**
    - Some Indian tribes use a single word in order to describe any male elder. The theory above may suggest that the individuals in the tribe are unable to differentiate their relationship between their brother and uncle. In reality, the members are able to differentiate relationships present between their relatives.
- **"An African tribe uses one word to describe any flying insect, and when asked to compare different species of flying insect believes them to be all the same"**

**The Structure of language**

- Over 3000 different languages present
- All languages have similar general principles
    - Languages use sounds, words, symbols to transmit information.
- **Morpheme**
    - Oral language: Smallest unit of sound that contains information
    - Sign language: Units of signs rather than sound
    - **A single word can be made up of many morphemes**

    - ***Tables***
        - 2 Morphemes. One identifies the object. One describes the numerical value of the object present.
    - **Pizza**
        - 1 Morpheme. Just gives information on the object
    - **Running**
        - 2 Morpheme. One Morpheme identifies the object, the second Morpheme, "-ing" tells us when the action is occurring
    - **Cats**
        - 2 Morpheme. One Morpheme identifies the object. The other Morpheme, "s" tells us the # of entities present.
- **Phonemes**
    - We can break a Morpheme apart into Phonemes. The way by which a phoneme can only be combined and used varies across different languages.
    - **Dog = 3 phonemes → /D/ /O/ /G/**
    - **Chair = 3 phonemes → /Ch/ /ai/ /r/**

**Syntax and Semantics**

- **Syntax** describes the rules that govern how sentences and words are put together. Syntax can also be referred to as, **Grammar**.
- **Syntax varies from one language to another.** For example, in French we must describe objects as being either male or female

using Le, La. In English, we only describe the gender of biological entities.

- **Semantics** describes the meaning of words within a sentence. A sentence may perfectly follow **Syntax** but have **no meaning** whatsoever.
    - **"The colourless green ideas sleep furiously beside the Kwijibo"** follows English syntax perfectly through the use of nouns, verbs and other items but makes no semantic sense.

**Development and Segmentation Problem**

- Human infants are unable to communicate complex information as they have not yet developed language skills. They communicate basic needs through crying.
- **Babbling (1 year old):**
    - Infant makes a wide range of sounds that resemble a combination of vowels and consonants
    - Babbling may involve rhythm and inflection. This may make it appear as if the infant is asking a question or stating a real sentence.
    - Babbling leads to progression towards real words
- **Language Explosion**
    - 1.5-6 years of age
    - Vocabulary size expands dramatically
- **Language production versus Comprehension**
    - An infant does not necessarily have 0 comprehension if they do not respond to a situation. Language production may be limited anatomically as, vocal cord may not have fully developed. Infant may not be able to express their intentions.

**The Segmentation Problem**

- Difficulty of segmenting speech stream into word units causes the perception that a certain language may be faster than it is.
- A test was conducted on infants determining the correlation between a wide range of vocabulary at 2 years of age, and the ability to segment as infants. **Infants who had a high segmentation ability at had a high expressive vocabulary at**

**2 years age. Infants who had a low expressive vocabulary as infants had a poor infant segmentation ability.**

- Testing an infant's segmentation ability could be a screen for future language problems.

**Infant-directed speech**

- By speaking as a low pace and exaggerating changes in vocal frequency, segmentation problem can be avoided and language development can be accelerated. **May help infants learn to segment speech.**

**Universal Phonetic Sensitivity**

- Young infants are able to discriminate **more phonemes** than adults can. This is because, we have not yet learned to specify our phonetic ability to one single language. Once we learn a language, our phonetic ability is restricted. Korean adults are unable to distinguish between the la and ra phonemes as, their language restricts their ability.
- Infants display **Universal Phoneme Sensitivity** and are able to discriminate between sounds that include those from their non-native languages.
- **Head-turn procedure** used to **measure perception of phonemes**
    - **Habituation** is used. An infant is exposed to a certain phoneme for a prolonged period of time before being exposed to a new phoneme. If a re-initiation of interest arises, the researchers can argue that the infant recognized the differences in the phonemes.
- **Phonetic sensitivity disintegrates dramatically within the first year of an infants life.**

**Accents**

- Environmental factors strongly influence Accents eh?
- **The Location and Dominate Speech pattern dramatically influences the accent produced.**

- **In rare instances, brain damage through stroke may also create a accent: Foreign accent syndrome.**

**Foreign Accent Syndrome**

- Injury to the Broca's area. An area which pays a significant role in speed production.
- The cerebellum, the area involved in motor coordination is damaged. Inability to adjust finely can produce phonemes that may appear to be foreign. The brain changes the rate of communication in order to make speech less difficult. This results in a apparent foreign accent.

**Theories of Language development**

- **Social Learning Theory** states that children learn language through a combination of imitation and operant conditioning. A infant may accidently stumble upon a word when testing varying combinations of phonemes and is most likely reinforced with praise, smiles, and attention. This promotes this behaviour and reinforces language development. Once learned, children apply a language rule to many new and different situations.
- **Feral children** display the necessity of social learning in language development. If the environment doesn't promote language development, the child will not learn to communicate through language.
- **Some argument against the social learning theory** is that, language development is far to **accelerated** and **complex** to be produced through **imitation** and **reinforcement** alone. There must be other factors guiding language development. Once children learn new words, they are able to apply them in ways that would have been thought **impossible** and could not have been reinforced.

**Overextensions**

- **Syntax errors**. For example, a child may learn that it's family's pet is called a doggie and call all four legged animals doggies. A child may learn that past tense is generally –ed and incorrectly add the suffix to actions such as ran (raned).

**Underextensions**

- When a child applies a rule far too specifically. For example, a child may refer to **only her dog** as a doggie. According to her, other dogs are **not doggies**.

**Innate Mechanism Theory**

- **Noam Chomsky**
- Although different languages may have variations of grammar rules, the underlying principles across various languages are fairly similar.
- Humans have **Language Acquisition Device** which allows us to rapidly develop language according to universal rules.
- Deaf children who have not been taught sign language spontaneously learn to do so in a autonomic fashion. What is interesting is that, the developed sign language may be different from the native language of their parents. This implies that a universal underlying set of rules must be present across different languages.
- Very young infants show neurological responses to the first language they are exposed to. This suggests that perhaps their brains may have been prewired in order to adapt to the sounds and their meanings as associated by their environment. This supports the fact that, there may be a **innate learning mechanism**.
- One theory arguing against this is from the fact that, chimps and other non-human animals may produce a form of sign language that resembles human language. This shows that nature is not entirely responsible for the production of human language.

**Animal Communication**

- **The Waggle Dance**
    - Communication of food by honeybees
    - Waggle and Return phase.

- **Bird Song**

- Mate attraction and competition

- **Lab experiments**
  - Classical conditioning techniques used to teach animals human language.
  - Washoe → Chimp learned sign language
  - Sarah → Taught to use symbols to communicate
    - She was able to us complex symbols to communicate
    - Both animals were not able to interpret the meaning of the words and construct new sentences by combining words in novel configurations.
  - Kanzi → Communicate using hexagrams (geometric figures)
    - No classical conditioning used. Immersion in the language used.
    - Kanzi used language quite vividly. No understanding of advanced concepts such as nouns verbs or adjectives. Still had limited grammar.

**Categorization**

- Our cognitive ability to place various objects, people, and ideas into categories and concepts helps us to efficiently process the incoming information and make appropriate responses. We respond based on the urgency of a situation.
- **Without the ability to categorize experiences, we would be overwhelmed by sensory information and would treat every experience as a unique experience. We would be unable to make connections with the past.**
- Categorization is a seamless process which happens constantly in order to initial **decision making.**

**Functions of Categorization**

- **Classification →** Treat objects that appear differently as belonging together. For example, apples may be different in the color dimension but are still treated similarly by the brain. Characteristics associated with apples such as sweetness **are color independent**.
    - **Calling a variety of objects "lamps" despite their difference in size and color.**
- **Understanding →** By simply looking at a scene, we are able to understand different aspects of it and form connections autonomously. For example, two people shouting automatically tells us that there may be a fight
- **Predicting →** By categorizing a current experience and relating it to past experiences, we can make **predictions about the current situation's needs.**
    - **Recognizing a bear and knowing to stay away from it because it might attack.**
- **Communication →** Many words in our language refer to some type of category or concept and using category names allows for efficient communication.
    - **Using the word "classroom" to refer to all rooms containing chairs and desks where classes are taught**

**Illusion of the Expert**

- Experts assume a task is simple because it was easy for them to complete it.
- **Categorization is actually a difficult process which we may make out to be easy due to its autonomic properties.**

**Rules**

- Humans have an **internal representation of categories** independent of the rules we try to define.

**Prototypes**

- **The best member of a category.** For example, the best member of the category fruits would be, "apple." When we visualize fruits, apples are typically the first item within the category which comes top mind.
- **Prototypes may differ amongst individuals.** Prototypes are typically formed through experiences and the surrounding environment. For example, if the availability of apples is scarce in your area but the availability of mangoes is high, the prototype for the category fruits would be mangoes for you.
- **Prototype theory** suggests that we categorize new objects based on their similarities to the prototype.
- Objects that share a large number of similarities to the prototype members are categorized faster than members that are significantly different from prototype members.

**Problems with prototype**

- Our prototype is continuously changing with experience. This contradicts the statement that, experiences are compared to an internal prototype. If this was true, our prototype member should remain constant over time.
- Prototype theory suggests that we store a single internal member which is usually the average of that category. For example, for the category "Dogs," our prototype would demonstrate various different features from a variety of dog species.

**Exemplar Theory**

- The exemplar theory suggests that we keep a record of all the different members of a category which we may have been exposed to through experience. For example, in the category "dogs," we remember every dog which we may have met in our lives instead of one ideal member.
- Each of these members is called an exemplar
- **When we are exposed to a foreign entity, we search thorough our list of exemplars in a specific category until a match is found. Once a match is found, we can relate the foreign entity to that category.**
- Frequency of previous exemplars influences the ability to identify a new entity as a member of a certain category. For example, we may be exposed to robins on various occasions while rarely exposed to penguins. Therefore, due to past experience, it would be easier to associate robins with the bird category than it would be to associate penguins to the category.
- **In the prototype theory, a single case being presented twice would simply blend in as, the prototype theory is based on a average of features. The exemplar theory is effected by even higher frequencies of a single case.**
- Not all exemplars are treated equally. Recent exemplars produce more effect than those from the past.

**Development of Categorization**

- Children around the **age of 3** are able to understand that, members of the same category are able to share similar characteristics.
- Children are also able to have a deeper understanding of categories. **Children are able to understand the fact that, we may modify a piece of machinery and completely alternate it's purpose and categorization. However, this is not possible with living organisms.**
- **Children younger than 3** years old are not able to understand general categories.

**Baboon Categorization**

- Basic categorization systems exist in non-human animals.

- **Baboon could categorize according to food vs. non food, as well as according to same vs. different categories with a high degree of accuracy.**

**Categorization allows us to treat members of a same category similarly while making predictions regarding new members. This allows us to react efficiently and appropriately based on PRIORITY.**

Unfortunately, stereotypes arise from categorization of a group of people based on a particular prototype. This is typically not due to experience and is therefore not related to Exemplar theory.

**Operational Definition of Intelligence**

- Edward Boring (no kidding…)
    - Intelligence is whatever intelligence tests measure. There is no one true definition for intelligence. However, **This is not what psychologists assume.**
- **Psychologists assume that, intelligence involves the ability to perform cognitive tasks and ability to adapt from past experience. It also involves the cognitive ability of an individual to reason well, remember important information, and cope with the demands of daily living.**

**Problem Solving**

**Deductive and inductive reasoning**

- When using **deductive reasoning**, we can come to **concrete solutions** based on a general **idea**. For example, if it starts to rain, we can be 100% sure the ground will be wet.
- **Inductive reasoning** relies on the **generation of a general idea** based on some concrete information. For example, if we wake up in the morning and the ground is wet, we can assume that it must have rained.
- **Theories and facts** are associated through inductive and deductive reasoning. For example, we may associate a fact with a theory based on inductive reasoning. The theory can relate back to the fact through deductive reasoning.

**Insight Problems**

**Functional Fixedness**

- We may have difficulty realizing the alternative potential for various objects. The key component in solving a riddle may lie directly in front of us, but we will continue to ignore it despite it's potential.

**History of Intelligence testing**

**The Qualities of a Test**

- A test must produce a **reliable** answer and must be able to **validate** any observations.
- **Reliability:** the extend to which the same result is produced if a person takes the test multiple times. **Intelligence is a static internal quality.**
- **Validity:** A test measuring only the trait that is supposed to be measured.

**Francis Galton**

- Quantify intelligence in a unbiased manner.
- Faster reaction times in individuals with higher intelligence

**Stanford-Binet Intelligence Test**

- A test that measures the ability of an individual to reason

**Charles Spearman & 'G'**

- Single type of intelligence
- Individuals who were intelligent should be intelligent in virtually every single field ranging from mathematics to vocabulary.

**Multiple Intelligences**

- **8 distinct types of intelligence:**
  - Verbal, Logical, Musical, Visual, Bodily, Interpersonal, Intrapersonal, Naturalistic
- Each type of intelligence is distinct from one another. A person may be brilliant at mathematics but terrible as music abilities.

**Human Intelligence**

**The Weschler Scales**

- Standardized tests which determine IQ levels. The IQ is based upon the # of people who took the test and their scores.

**Genetic and Environmental Contributions**

- Does a person's genes result from his/her environment of from nature (genetics)?

- **Both genetic factors and environmental factors are essential in order for intelligence to rise.**
- The correct question to ask then is, what plays a larger role in influencing intelligence, genetics or environment?
- **Twin studies**
    - Identical twins which share 100% genes have a IQ correlation of 0.8.
    - Fraternal twins which 50% gene shared have a 0.6 IQ correlation.
    - Environment must play some role in IQ!
    - Identical twins raised in different environments display a 0.7 correlation in IQ levels.

**Flynn Effect**

- Since 1932, the mean raw score of a IQ test has been steadily increasing. This in turn shows that human intelligence is on the rise.
- About 9-15 points every year.
- **Increased access to information through books, television, internet have influenced the Flynn effect.**
- In addition, an increase in multitasking roles and multimedia may have also lead to increased processing.

**Piaget and Intelligence Development**

- Children are **Active** learned that manipulate and explore their environment in order to develop intelligence by **incorporating** new information into what they already know.

**Schemas**

- **A mental framework by which we interpret the world around us.**
    - If someone frowns at you, you can interpret this as the fact that they may not like you.
    - A schema allows one to make inferences about the behaviour of others around you.

**Assimilation**

- **Incorporating new information into existing schemas to further our understand of various things around us.**
    - A child may learn to incorporate the link between frowning and it's negative meaning.

**Accomodation**

- **Modifying existing schemas in order to allow new information to be incorporated without confliction.**

**The four stages of Piaget development**

- Sensory-motor → Preoperational stage → Concrete operational stage → Formal operational stage
- Although a child may pass through the changes at different rates, they must pass the stages in a sequential order.

**Sensory-motor Stage**

- Between ages **0-2**.
- **Object Permanence**: when a object is out of site, it still continues to exist despite being out of visual range.

**The preoperational stage**

- Between the ages **2-7**
- Difficulty understanding world from a perspective other than own due to **egocentric behaviour.**
    - "If I want to play now, surely everyone else around me wants to play now"
- Difficulty with **seriation** tasks. Unable to order a list of items logically.
- Difficulty with **reversible relationships.**
    - An infant may be able to identify her relationship with her brother but may not be able to identify her brother's relationship with herself.
- Difficulty with **conservation of mass.**
    - A preoperational child will not realize that, glasses with exactly same volume capacity but different dimensions can hold an equal amount of a substance. (conversion task)

**Concrete operational stage**

- Between the **ages 7-11**
- Unable to perform **abstract thinking** or **reason based on hypotheses**.
- **Schemas concrete** and based on her experiences of the world.
    - The child will not modify her schema in order to fit in new information and will strongly believe what she has experienced for herself.

**Formal operational stage**

- Children are able to think in abstract terms, think in accordance to hypotheses, and perform a wide range of cognitive tasks.

**De collage**

- The stages described by Piaget's theories can be built out of order which goes against Paget's theory.
- Piaget's theory heavily relies on a child's language ability.
    - The child may be confused by words such as "more" or "less."

**Biases and Heuristics**

**Confirmation Bias**

- Our tendency to seek out information which directly supports our hypothesis.
- The best method by which to see if you were right is by testing to see if you were wrong.

**Availability Heuristic**

- Our tendency to make decisions based on information that is available quickly to us. We generally avoiding searching for contradicting information and quickly come to a conclusion. This may result in errors.
- Thinking that a person with a British accent is from UK is an example.

**Representative Heuristic**

- Our tendency to assume what we are seeing is representative of the larger category we have in mind.
- Associate certain traits to a category of individuals. For example, English professors would be attributed as quiet, and individuals who love to read.
- Another example relates to probability. If a coin is flipped several times and the result is a majority of heads, an individual may predict that there is a high probability that the next outcome will be heads. In reality, there is equal chance that the next outcome will be tails instead of heads.

**Difference between Availability and Representative Heuristics**

- Availability Heuristics refers to when rapid decisions relying on information readily available to us are used to make decisions.
- Representative heuristics refers to decisions made with representatives of a certain category (sort of like prototypes).

**The question then is, how accurate is a test of intelligence? It is very difficult to define and measure an abstract concept such as intelligence.**

We are already experts at forming impressions of people around us through a lifetime of **Social interactions.** For every behaviour, there are **many** possible motivating factors. Therefore, identifying the intention of a person may be **difficult**.

**Attribution Theories**

- We can get a lot of information about a person by observing their behaviour. However, the **accuracy** with which we may identify circumstances will vary.
- Is the behaviour due to a **fixed** personality or the current situation?

**Correspondent inference theory**

- The **degree of choice, expectation,** and **intended consequences** determine the inference made.

**Degree of choice**

- The side of a argument that we made support reveals a lot about our personality.
- For example, during a debate about the validity of death penalty, if one individual chooses to support the practice whilst we do not, we may associate negative attributes towards that person.

**Expectation**

- **Uncommon** behaviour gives us a lot more information than common behaviour.
- If a person behaves in a unexpected way, a reason to determine the underlying cause is generated.

**Intended Consequences**

- What is the intention of the behaviour? Why is someone performing the behaviour?
- For example, a tobacco company may place a advertisement displaying the decreasing rate of tobacco smokers. The company is simply doing this in order to generate a false caring impression.

**Covariation Theory**

- Is the behaviour displayed generated by personal disposition or situational circumstances?
- **Consistency, Distinctiveness,** and **Consensus** determine whether the behaviour is dispositional or due to circumstances.

**Consistency**

- Does a person regularly behave in this way during similar situations?

**Distinctiveness**

- Does the individual behave differently in different situations?
- If the individual behaves differently, then this may be the cause of the situation. If the individual behaves differently, this may be dispositional.

**Consensus**

- Do others behave similarly in this type of situation?
- If everyone behaves similarly when exposed to the situation, this may be a situational behaviour. If everyone behaves differently, this may be personal dispositional.

**The Fundamental Attribution Error**

**Fundamental Attribution Error**

- Our tendency to over-value dispositional factors for a observed behaviour, whilst under-valuing situational factors.
- For example, being cut-off by a car in heavy traffic may generate the impression that the person must be a aggressive and inconsiderate driver. However, we do not think that, perhaps the individual was frustrated and late for a job interview.

**Actor/Observer Effect**

- When considering our own behaviour, we are more influenced by situational factors. On the other hand, when determining the behaviour of others, we assume that dispositional factors are the only cause.

- When young drivers were asked to explain their risky driving habits, they explained that it was due to situational stress. However, when adults were asked to explain the risky driving habits of the younger population, it was to show off.

**Cultural Differences**

- The fundamental attribution error varies amongst populations. For example, Indian children around 11 years of age have a tendency to make more situational than personal attributions. American children at the same age make dramatically more personal then situational attributions.
- Adults of Indian culture and American culture had even more attribution differences.
- In collectivist societies there is less focus on the individual whilst more focus on relationships. In this type of a society, the fundamental attribution error is diminished.

**Self-serving bias**

- Our tendency to perceive ourselves favorably

**The above average effect**

- Dispositional causes are responsible for our successes, but situational causes are responsible for our failures.
- Exaggerates our view of our abilities.

**Cognitive Heuristics**

**Representative Heuristic**

- How well does a particular behaviour fit with a certain prototype?
- We will pick a certain individual as belonging to a population based on description. We will ignore probability statistics when attributing the individual towards the population.

**Availability Heuristic**

- Availability of positive memories will influence our impression of a particular person/thing.

- Considering how likely someone or an event is by considering how easy it is to come up with examples of that person/event.

**All of the methods of perception above may be influenced by biases.**

**Relationships**

- Several factors influence the ability of a person to be attracted towards you. They are, **proximity, familiarity, Physical attractiveness,** and **other's opinions.**

**Proximity**

- We are more likely to become friends with those who live closer to us.
- However, there can be high proximity but low functional distance. For example, we may be close to one another but not have a opportunity to interact.
- **We like individuals who we anticipate interactions with.**

**Familiarity**

- Meer exposure effect
- More positive towards things that are familiar. Even if we may have only seen the items once or twice in the past.
- In an experiment, individuals were exposed to words from a foreign language that were presented in high frequency. When identification tests were performed later on, the subject misattributed the displayed words as being more positive. This shows the effect of familiarity.
- **Our attraction towards a persons face also depends on familiarity! We are attracted towards celebrity faces as, they are famous.**

**Physical attractiveness**

- What is beautiful is also good
- When compared with less physically attractive individuals, those who are physically attractive are generally portrayed as being kinder, warmer, and more sensitive.

- Attractive individuals make more money and date more attractive people.

**Liking those who like us**

- Having someone like you when their self-esteem is low boosts our attractiveness towards that person. This does not occur when self-esteem is raised or not manipulated in any way.
- If an individual feels negative towards us but progresses to feel positive towards us, our attractiveness towards them is increased.
- If an individual feels positive towards us but progresses to feel negative towards us, our attractiveness towards them decreases.

**Our thoughts and behaviour are determined by other individuals around us. Common sense does not always equal research findings.**

**Presence of Others**

- **Norman Triplett:** First person to study social psychology
- When placed in group scenarios, we are motivated to perform better than we would in a individual scenario.
- The mere presence of others was a positive influence in the performance of the actor. **Co-Actor** are other individuals that are performing the same task and motivate us. **Audience** is the group of people observing the task.
- **Social Facilitation** refers to the increased performance that occurs in the presence of co-actors and audience
- **Social facilitation cannot explain as to why our performance in certain activities is hindered when other individuals are present.**
- **Zajonc's resolution** states that, for tasks which have been well practiced and are simple, performance increases in the presence of a audience or co-actors. In complex tasks however, performance decreases when co-actors or audience are present.

**Social Learning Theory**

- We learn appropriate behaviour by modeling and imitating the behaviour of other. There is typically no reinforcement required.
- **How are social behaviors shaped?**
- In the **Bobo Doll Experiment**, children were placed in a room with a Bobo Doll and a adult. The adult was told to behave in a aggressive or passive manner with the doll. When the children were placed alone in a separate room with a Bobo doll, they performed the same actions as what they had witnessed before. **The behaviour showed by the experiment was spontaneous and required to reinforcement.**

**Conformity**

- It is difficult to be a person that stands out from others by not participating in a social situation.

- **Sherif and Norm Function**
    - **Norm formation** refers to the influence other individuals have on our perception of a event. We may start out with a completely different perspective on an event. However, as we speak to others, we may be influenced by their perceptions. At the end, our own perception will be a mix of the different inputs.
- **Asch's Stimuli**
    - An experiment was conducted in which 7 participants were selected. Out of the 7 participants, 1 was a true subject.
    - The participants were told to analyze something and answer a question. The subject was the $6^{th}$ person to go.
    - The individuals before the subject gave bluntly incorrect answers on purpose. Despite having written down the correct answer, the **subject also gave an incorrect answer**.

**Normative function**

- The role of others in setting standards for our conduct based on a fear of rejection
- We dress and behave similar to others in our society due to fear of rejection for not confirming.

**Comparative function**

- In a ambiguous situation, we typically rely on the behaviour of others and how they are interpreting the situation.
- A subject under no social pressure may pick the wrong answer to a ambiguous question as, others may have picked it. The subject believes that others may know more about the situation than they do.
- **The comparative function allows us to compare our ideas against information and perceptions from others around us.**

**Group Dynamics**

**Decision making and the risky shift effect**

- Groups are more confident than individuals

- The group decisions were riskier than the decisions made by individuals in certain conditions. However, in some cases, the group decision was much more conscious than the individual's decisions.
- **Group Polarization:** decision making in a group strengthens the original inclinations of the individual group members. Therefore, the decision making can be shifted in the **risky** direction, or the **conscious extreme** direction.

**Groupthink**

- A group decision making environment that occurs when group cohesiveness becomes so strong that it overrides realistic appraisals of reality and alternative opinions.
- **"Mob mentality"**
- members who fall victim to groupthink fail to evaluate, analyze, and critically think about a certain argument before jumping to conclusions. Individuals may suppress their own opinions in order to fit in and conform in the group.

**Groupthink strategies**

- Be impartial
- Critical evaluation
- Devil's advocate (allow group members to disagree)
    - a member who is assigned the role of presenting counter arguments.
- Subdivide the group
    - See the arguments different mini-groups come up with.
- Organize a second chance meeting to resolve any lingering doubts.

**The bystander effect**

**Kitty Genovese**

- Witness observed murder taking place but did absolutely nothing in order to prevent Kitty Genovese's death.
- The presence of a significant level of witnesses resulted in a lack of action by any one of them. Each witness assumed that the police had already been called and therefore took no action.

**Two decisions**

- Before responding, an individual decides whether the situation was a **true emergency**. The individual also decides whether a **response is required** by them. If the answer to either of the questions is **no**, the individual will **fail** to respond.

**Collective ignorance**

- When each individual in a group sees nobody responding in a given situation, they conclude that the situation is not an emergency and do not respond.
- **Multiple individuals make the decision to not speak up about an ongoing accident, due to the behaviour of the other individuals around them.**

**Diffusion of responsibility**

- **As the number of people in a group increase, the motivation for performing a action decreases.**
- In deciding whether we have to act, we determine that someone else in the group is more qualified.

**Getting help**

- Collective ignorance and diffusion of responsibility is what caused the witnesses of the kitty Genovese case to fail to respond.
- The witnesses assumed that a more qualified person or another person would respond to the emergency.
- **By being direct and asking a particular bystander to respond, we can break the diffusion of responsibility and the collective ignorance.**
- **Helpful behaviour is contagious. When a individual witness someone helping someone else, they are more likely to offer help themselves in the future.**

**Social Loafing**

- Special case of diffusion of responsibility. Individuals seem to be less motivated when working in a group than when working alone.

- For example, a group of individuals playing tug of war were blindfolded and told that there would be others behind them to pull the rope as well. These individuals pulled with 18% less power than they would otherwise.
- **The individual does not realize that his participation level in a group environment has changed.**
- **We seem to diffuse responsibility not only in emergency situations, but also during regular group activities. We may not perform as well in a group as we would individually.**

Often people will use the excuse, "I was only following orders." Is the individual responsible for his/her actions? Should the individual be persecuted if he/she broke ethical or moral rules?

Obedience

**Milgram's experiment**

- Understanding human motivation and obedience to authority.
- The experiment consisted of a teacher, and 2 confederates.
- The teacher was the subject of the experiment. He was told to apply electrical shock to the learner for every incorrect answer they gave. The severity of the shock continuously increased.
- The experimenter confederate assured that no health hazards would be presented. The subject continued to apply lethal doses of electricity despite several warnings by the power generator machine.
- **Over 65% of subjects continued to the very end of the experiment!**
- Most civilians will obey orders given to them, even if it means that harm may be inflicted on innocent people.

**Important lessons**

- Individuals have a very strong level of obedience towards authority.
- We are not accurate judges of how we would behave in a certain situation. Almost 99% of people say that they would not go through entire Milgram experiment. However, 65% end up giving doses of lethal shock.
- Milgram experiments thought to be unethical due to the stress that they place on their subjects. We would not be able to conduct the experiments today due to ethical guidelines.

**Manipulations**

- Obedience was also influenced when the subject felt a sense of authority. Prestigious university such as Stanford created a false sense of security. The subjects felt assured that the experimenter knew much more about the topic then they did.

- **Shifting the location** of the experiment to a run-down office resulted in a significant drop in obedience averages. Only 50% of the subjects went through the entire experiment.
- When the **experimenter was replaced with a undergraduate student,** the percentage dropped further. The student did not elicit a sense of authority that the experimenter did. The subjects felt less secure and did not participate.
- Shifting **location of learner** also dropped the percentage of completion rate. When the learner was in the same room as the subject, the level of obedience significantly dropped. Basically, when the proximity between teacher and learner was altered, so was the level of obedience.
- The **location of the experimenter** also affected the percentage of completion rate. When the experimenter was a distant proximity from the learner, the rate of completion dropped significantly.

**Obedience in the real world**

- How does Milgram's experiments have influence on everyday actions?
- Experiment performed in a hospital. An individual pretending to be a doctor, advised a nurse to give a large dose of a fake medication to a confederate patient. The nurses followed the order despite, the breaking various hospital regulations.
- 95% of nurses said they would not obey such a order. However, 21/22 nurses actually obeyed the order given over phone!
- We do not realize how we are going to act until we are placed in a given situation.

**Cognitive Dissonance**

- Our attitudes do not always match up with our behaviour. For example, when we are obeying a command, following social convention, or joining a group, we manipulate our behaviour to fit in. Our attitudes may differ.
- Subjects were made to perform a boring experiment. After the experiment, the subjects were given $1 or $20 to tell the next person how the experiment was very interesting. In a follow-up

survey, results revealed that the individuals given $1 found the experiment to be more interesting than the individuals who were given $20.

- The individuals given $1 had no justification towards lying to the next person of the interestingness of the experiment. This formed a dissonance in their head. Why would I lie (perform behaviour) if my attitude towards the experiment was different? In order to reduce this dissonance, the subjects truly believed that the experiment was more interesting then it had been.
- The $20 group did not change their attitude towards the experiment because, they realize that they did it for the money! No conflicts between the attitudes and behaviour. Therefore, no dissonance generated. Intact attitude allows them to continue believing that the experiment was rather boring.
- **For a cognitive dissonance to take place, there must be a insufficient justification conflict between the attitude and the behaviour.**
- **Note that, the subject that was paid the higher amount did indeed have a easier time lying.**

**Overjustification effects**

- If one over-justifies behaviour with outside motivation, attitude change is less likely to occur.
- **If instrumental conditioning is used to train a specific behaviour, the attitude towards that behaviour won't be changed. In addition, the behaviour will seize to exist as soon as reinforcement stops.**
- **If one somehow convinces a person to perform a behaviour without reinforcement, a dissonance will be created. The person will wonder why he/she is performing the act. As a result, a change in attitude will result.**

**The Stanford Prison Experiment**

- Makeshift jail constructed in basement of Stanford University Psychology department.

- Purpose: Study the behaviour of normal people under situations of abnormal authority.
- The results were shocking. The prisoners and guards took their roles very seriously. Just after six days, the guards only called the prisoners by their numbers and performed acts such as naked parades.
- Demonstrates the effect that circumstances and assigned roles can have on behaviour

**Deinviduation**

- In group situations where individuality is suppressed and members loose a sense of personal responsibility and restraint.
- **Milgrim experiment modified. Individuals wore hoods whilst acting as teachers. The removal of individuality also resulted in the suppression of responsibility. Therefore, a higher degree of shock was conducted by individuals wearing a hood then individuals who were unhooded.**

**Persuasion**

**The Communicator**

- Individuals that have high credibility are most persuasive communicators. Dentist over Bartender for teeth advice
- Attractive individuals act as better communicators.
- Those who resemble yourself act as better communicators.

**Similarity to yourself or Credibility?**

- **Similarity more important for personal lifestyle choices**
- **Credibility more important when objective fact plays role.**

**The message**

- One sided or two sided opinion
- If your audience initially agrees with your suggestion, one sided argument is effective.

- If audience disagrees with your suggestion, two sided argument is effective. Acknowledge the view of the other individual and counter his/her points with your own points.

**The Audience**

- **Central Appeal**
  - Well reasoned, factual, two-sided arguments
  - Effective for intelligent audiences
  - **Require a good message**

- **Peripheral Appeal**
  - Well presented, easy to understand messages
  - Effective for unintelligent audiences
  - **Require a good communicator**

**Techniques in Persuasion**

**Foot in the door effect**

- A gradual escalation of demands increases obedience.
- A request that seems crazy in isolation will appear less crazy in a situation where the demand has been brought up gradually through many other smaller requests.
- Officer Scott's case:
  - Gradual escalation of demands, title, use of authoritative language lead to obedience.

**Low Ball Technique**

- Escalating terms of agreement after someone has already agreed.
- The initial decision seems irreversible
- Involves cognitive dissonance

What is abnormality?

- Deviance
  - Thoughts, emotions, and behaviour that differ from the standards that people are following.
  - However, cultural practices do not count.
  - People with psychological disorders deviate in some way from the typical behaviour of others.
- Distress
  - Intense negative feelings due to their behaviour.
  - Psychological disorders often, but not always cause strong feelings of distress.
  - For example, many sufferers of antisocial behaviour do not feel distress. At certain times, individuals suffering from bipolar may feel no distress.
- Dysfunction
  - Behaviour interferes with the ability of a person to function in their daily lives. Mal-adaptive behaviours which inhibit individuals from adapting to their environments.
  - Psychological disorders often cause dysfunction in everyday tasks. However this dysfunction may also be voluntary, such as during a hunger strike.
- Danger
  - Danger to oneself or to another
  - Psychological disorders often, but not always, cause a person to place themselves or others in danger.
- No Single D can be used to identify a psychological abnormality!

Classifying Disorders

- Diagnostic and Statistical Manual of Mental Disorders
- Practitioners use this book as a guideline for identifying disorders.
- Provides standardized criteria to aid in the diagnosis of psychological disorders.
- Allows communication amongst researchers through common language.

General Diagnostic criteria according to the DSM

- The disordered behaviour must be a result of the person and not the surroundings they are in.
- Disorder is involuntary and the sufferer is unable to control symptoms experienced.

Categories in the DSM

- DSM groups together disorders which display similar symptoms
- Similarity suggests a common cause which may be similarly treated.
- DSM is not fixed, based on new findings the DSM changes.

Models of Psychopathology

Significance of models

- The DSM only describes a pattern of symptoms. The DSM does not provide treatment plans. It can only be used to identify the illness.
- Psychopathology allows us to devise a treatment through models. Psychopathology attempts to explain causes of a disorder and helps decide how to treat it.

Biological Models

- Psychological disorders may be due to malfunction in brain activity.
- Physical damage or chemical imbalance in neurotransmitters cause disorder.
- Genetics, nutrition, disease, stress to explain malfunction.
- Drugs are often used to treat disorder.
- Brain surgery or electroconvulsive shock may be used.

Psychodynamic model

- Mental disorders rooted in a internal malfunction
- Mental conflict in the monistic mind are responsible.
- Mental conflicts cause disorders. Conflicts may be unresolved from childhood issues.
- Psychoanalysis must be used. Drugs are not the solution to the problem. Therapy providing personal insight so that the patients may cope with themselves.

**Both models above agree that mental disorder is a internal problem**

Behaviourist model

- The behaviours and emotions are the problem. It is the external factors that are the root of the problem rather than internal functions.
- Classical and instrumental conditioning is responsible for alterations of behaviour into disorders. The same techniques can be used to treat malfunctioning behaviours.
- People may find that disordered behaviour provides "reward attention from others" Therefore they may continue to behave abnormally.
- Not all behaviours are explainable through this model. What about people who claim to hear voices in their head? This therapy does not transfer well into other environments. Fails to understand that humans are not simple. They have the ability to plan, think, and control their actions.

Cognitive model

- Maladaptive behaviour results from misinterpreting information from the environment.
- The way we interpret events effects the behaviour we generate
- Experience and learning shape maladaptive thinking. Identify maladaptive thinking and change it through positive interpretations.
- Cognitive Behavioural therapies seeks out positive situations and actions.

Mood Disorders

- Disturbances in emotion
- Depression (lowered) → Mania (elevated)
- Unipolar Depression (severe) → Staying in bed, fatigue

Dysthymia

- A variation of depression
- Less severe forms of depression. A Moderate level of depression.

Bipolar Disorder

- Experiences episodes of depression and periods of elevated mood called mania.
- During mania, heightened self-esteem, energy, and activity observed. Very little sleep.

Cause of Depression

- Biological model: Chemical abnormalities in brain
  - Anti-depressants which reverse brain chemistry.
- Behavioural model: Individuals who lack social skills
  - Lack of interaction and reinforcement leads to lowered moods.
  - Learn helplessness. The feeling that everything is out of your our hands and you cannot do anything.
- Cognitive model: Individuals who view themselves negatively
  - Maladapted cognitive processes. May view neutral or positive events as being negative.
  - Cognitive behavioural therapy makes people more aware of how they think and how this contributes to how they feel.
- Psychological model: Thought process negative.
  - Psychoanalysis therapy

Anxiety Disorders

- Most common type of illness.
- Individuals suffering from anxiety disorders feel prolonged levels of anxiety which may interfere with daily activity.
- Generalized anxiety disorder causes continuously worry about minor things like repeated events and normal everyday tasks. Being worried all the time can cause various physical symptoms. Individuals may feel dizzy, drowsy, or sleepy.
- Obsessive-compulsive disorder deals with individuals who are obsessed to perform certain tasks. This may interfere with day to day living. Obsession is basically an idea which takes over the conscious mind and forces us to believe that we have done

something wrong. A compulsion is a behavioural ritual which is performed in order to dilute the obsessive impulses in the brain.
- Post-traumatic Stress disorder. An extremely unpleasant situation can trigger an anxiety disorder. Flashbacks may occur. The person may feel as if they are reliving the event rather than recalling it.

Etiology and Treatment

- Psychoanalytic model argues that most anxiety disorders occur due to a conflict between the ego and the id.
- Id impulses seek expression. The Ego inhibits the Id. This creates anxiety.
- In OCD, the generated compulsion is a defense present to counter the unacceptable ID impulse. The compulsion/obsession is in reality underlying a problem present in our mind.
- Biological model looks for physical causes. Drug + psychological therapy.
- Cognitive behavioural therapy uses a variety of techniques to reduce anxiety. Cognitive component uses strategy to teach individuals the true intentions and purpose behind their thoughts. The behavioural component uses instrumental conditioning.

Somatoform Disorders

- Disorders that display physical symptoms but are entirely psychological. Therefore, we cannot combat them through physiological drugs. For example, ghost limb is one disorder.

Psychophysiological disorders

- For example: Stress can induce lower immune response = Sickness.
- Psychological disorders which causes physiological disorders. For example, anxiety may cause a headache, which can then be reduced by taking a Tylenol.

Conversion disorder

- Individual displays physical symptoms without any physiological causes. Usually develop during a stressful situation.

Hypochondriasis

- Could involve misinterpretation of bodily signals
- Person believes to have a serious illness despite medical evidence proving that they don’t