

## **Research Methods 1**

### 1. Construct a theory

- Collect a general set of ideas about the way the world works

### 2. Generate hypothesis

- Form a testable statement guided by theories that make specific predictions about the relationship between variables

### 3. Choose research method

- Determine the way in which the hypothesis will be tested

### 4. Collect data

- Take measurements of the outcomes of the test

### 5. Analyze data

- Understand the data and discover trends or relationships between the variables

### 6. Report the findings

- Publish articles in scholarly journals

### 7. Revise existing theories

- Incorporate new information into our understanding of the world

Anecdotal Evidence: Evidence gathered from others or self-experience

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

Independent Variable: Variable manipulated by the scientist

Dependent Variable: Variable being observed by the scientist

Experimental Group: Receive manipulation of independent variable.

Control Group: Do not receive manipulation of independent variable.

Within-Subject Design: Manipulating the independent variable within each

participant to minimize the effect of external variables on the dependent measure.

Practice effect: Improved performance over the course of an experiment due to becoming more experienced

Between Subjects Design: One group acts as the control group.

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

Results from very specific groups of participants CANNOT be generalized to other groups.

Population: General group of people we're trying to learn about.

Sample: Selected people from that population that we collect data from. The best sample is a random sample.

Random Sample: Choosing a sample at random from the entire population. It ensures that the findings of the study can have broader implications for the population.

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

Placebo Effect: Effect that occurs when an individual exhibits a response to a treatment that has no related therapeutic effect.

Participant Bias: When a participant's actions in an experiment influence the results outside of the manipulations of the experiment.

**Blinding:** When participants do not know whether they belong to the experimental or control group, or which treatment they are receiving.

**Experimenter Bias:** Actions made by the experimenter, intentionally or not, to promote the results they hope to achieve.

**Double-Blind Studies:** Experiments in which neither the experimenter nor the participants know which group each participant belong to.

## **Research Methods 2**

**Histogram:** Type of graph used to report the number of times groups of values appear in a data set.

**Frequency Distribution:** Type of graph illustrating the distribution of how frequently values appear in the data set.

**Normal Distribution:** A distribution which a characteristic smooth, symmetrical, bell-shaped curve containing a single peak.

**Mean:** The average value of a data set.

**Outliers:** Extreme points, distant from others in a data set.

**Mode:** The value that appears most frequently in the set. Can be used for non-numerical data.

**Median:** The center value in a data set when the set is arranged numerically.

Measures of central tendencies do not sufficiently summarize the data.

Measures of variability tell us how “spread out” our data is. Standard deviation is the distance from the mean.

**Inferential Statistics:** Statistics that allow us to use results from samples to make inferences about overall, underlying populations.

**T-Test:** A statistical test that considers each data point from both groups to calculate the probability that two samples were drawn from the same population.

**P-Value:** A value expressing the probability calculated by the T-Test.

If resulting P-Value is less than the set value 0.05, the results are statistically significant. Less than 5% probability that they would have found the observed value differences purely by chance. The probability that the same results would have been found if the control and experimental groups come from the same population. Would find the same results 5% of the time.

**Statistical Significance:** When the difference between 2 groups is due to some true difference between the properties of the 2 groups and not simply due to random variation.

Observational experiments avoid unethical experimenting.

**Correlation:** A measure of the strength of the relationship between 2 variables.

Correlation Coefficient of +1 means Perfect Positive Correlation. -1 means Perfect Negative Correlation. Approaching 0 is a weak correlation. A 0 CC means no correlation. Corr. is not causation.

**Chapter 2 – Page 69 Terms**

Operational definitions are essential and they are always open to argument.

Parsimony: Choosing the simplest theory with the most explanatory power. Between 2 theories, scientists tend to prefer the one which consists of the least assumptions.

Natural Order: Same effects are made from safe causes.

Generalizability: Causes that produce our effects in lab also produce those effects elsewhere.

Conservatism: Support the current explanation until new facts accumulate that the current explanation cannot deal with.

Empiricism: An approach that emphasizes that knowledge should be based on actual observation and not on reason alone. Claims and theories are based on observable, testable phenomena, not merely reasonable claims/assumptions.

Inductive reasoning allows us to build theories based on various incidents of observed phenomena converging on a hypothesis or set of hypotheses.

Deductive reasoning allows us to make predictions about certain phenomena based on the testable claims of a particular theory.

A test must be reliable and valid. Reliability is the ability of any test to give the same output, given the same input. Validity is the ability of a test to measure what we intend to measure.

Case studies involve the meticulous, long term study of an individual or small group of individuals, but are not necessarily

generalizable to populations. Case studies are very valuable to psychology. Case studies are important starting points for much research and active replication and further research can help establish theories formulated.

Correlation studies seek to point out relationships between two or more variables by examining the direction and strength of observed relationships. Correlation data can help us make accurate predictions, but they do not indicate causes and effects; two variables may be strongly related but other unknown variables may actually be contributing to the observed relation.

Experiments allow us to establish cause and effect relationships but the amount of control in lab settings may deem the experiments as inaccurate representations of how things occur in the real world; this emphasizes the need for a variety of research techniques.

Descriptive statistics essentially organize and describe sample data.

Inferential statistics employ a number of methods to answer questions about why the data are the way they are and to test whether differences between groups are due to significance, legit causes and effects.

Variability describes how much the population strays from the mean and is vital to understand for it allows us to explore whether groups are significantly different or differences are due to chance.

Standard deviation allows us to answer questions about differences when combined with measures of the overlap and

variability. The less overlap, the smaller the variability, the stronger the differences between groups and the more likely the differences are not due to chance.

Errors are inevitable in research, but employing the scientific method properly through replication and error controlled, they can be strongly reduced.

Type 1 errors involve claims that there are effects of the independent variable when differences are actually the result of sampling errors.

Type 2 errors involve claims that manipulations do not have effects when they actually do.

Hypothesis Testing: A significant difference between experimental and control group results in two identical distributions with different means.

**Classical Conditioning****Unconscious Learning:**

Classical Conditioning: Associate two related events

Instrumental Conditioning: Associate actions and consequences

**Classical Conditioning**

The learning of a contingency between a particular signal and a later event that are paired in time and/or space.

Conditional Reflex: Conditional upon training

Contingencies: When one stimulus reliably predicts the presentation of another. Can respond to event before it occurs. Acquired mostly during earlier trials. Some can be acquired in a single trial.

Signal → Event

Unconditional Stimulus (US):

- Any stimulus or event.
- Occurs naturally, prior to learning.

Unconditioned Response (UR):

- The response that occurs after the US
- Occurs naturally, prior to any learning.

Conditional Stimulus (CS):

- Paired with the unconditioned stimulus to produce a learned contingency
- CS appears before US

Conditioned Response (CR):

- The response that occurs once the contingency between the CS and the US has been learned.

Acquisition

- The process by which a contingency between a CS and US is learned.

Rats avoid unfamiliar foods (neophobia)

Rats eat small quantities of food at a time

**How long does a contingency last?**

As long as the CS is a reliable cue for the US, the contingency will be maintained. Else, the CR will fade.

Extinction:

- The loss of the CR when the CS no longer predicts the US.
- You don't unlearn the CS, you just control yourself.

Spontaneous Recovery:

- The sudden recovery of a conditional response following a rest period after extinction.

Stimulus Generalization:

- The process by which stimuli similar to the CS will also elicit a CR

Stimulus Discrimination:

- Narrowing the generalization gradient by presenting the gradient without the US.
- CS+ predicts the US
- CS- predicts absence of US
- Refines the learning process

Implosive Therapy: Encouraged to confront the CS in the absence of the US.

Systematic Desensitization: Gradually reaching their phobia.

### **Chapter 3 – Classical Conditioning**

Learning is distinct from merely performance or changes in behaviors; learning is often context specific and goes beyond natural responses to stimuli

Latent learning: Acquiring associations that are not immediately expressed or expressed only in appropriate contexts.

Not all learning is permanent, but it is often retained relatively strongly over time even if the behaviors involved are not continuously expressed. Experiences throughout life are key to learning and often distinct from developmental changes; adaptations to environmental cues through realizing associations form the foundations of learning.

Habituation: A decrease in response to a stimulus or event as it is repeatedly presented without any consequence.

Dishabituation: An increase in response to a change in the stimulus to which habituation has occurred.

Homeostasis: Maintaining the body's internal equilibrium.

Sensitization: An increase in response to a stimulus or event as it is repeatedly presented.

Asymptote: When learning has reached a peak.

Reacquisition: The reintroduction of conditioning trials after extinction has occurred. Reacquisition is faster than acquisition indicating some of the original learning is retained after extinction.

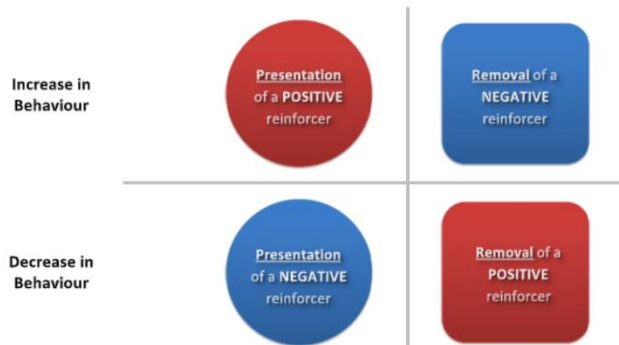
## Instrumental Conditioning

Explicitly training between voluntary behaviours and their consequences.

The learning of a contingency between behaviour and consequence.

Favourable behaviours are “stamped in”, unfavourable behaviours are “stamped out”.

The Law of Effect: Behaviours with positive consequences are stamped in. Those with negative consequences are stamped out.



Reward training is presenting a positive reinforcer to encourage a behaviour.

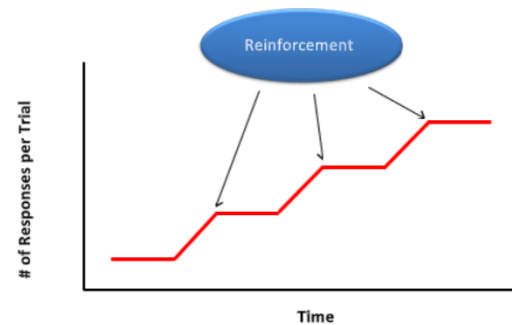
Punishment training presents a negative reinforcer to discourage a behaviour. May risk being unethical or distressing.

Omission training removes a positive reinforcer to discourage a behaviour. Different means than punishment training.

Escape training removes a negative reinforcer to encourage a behaviour.

The timing of a reinforcer is critical to its effectiveness on a behaviour. Best when consequence immediately follows response.

Cumulative recorders visualize the response rate of behaviour.



Flat horizontal segments = no responses

Upward slope = a response has been made.

Pattern depends on: Subject, Complexity of Behaviour, Type of Reinforcement Used.

This is reward training in the image.

Autoshaping: Learning without direct guidance.

Shaping By Successive Approximation is used for behaviours that are too complex to be autoshaped. Complex behaviour can be created into smaller steps. Each step can be reinforced using reward training. Use by animal trainers.

Contingencies are not always valid. The Discriminative Stimulus indicates when a contingency is valid ( $S+ SD$ ) or invalid ( $S- S\Delta$ ).  $SD$  – response is voluntary.

The Discriminative Stimulus can be generalized for a varied response rate.

Extinction can alter the Generalization Gradient of the  $SD$ .

Reinforcement doesn't always follow a consistent schedule. Partial reinforcement can either follow a ratio or interval schedule.

**Ratio Responses:** Number of responses determines when reinforcement is given. FR-1 is rewarded every response. FR-10 is every 10.

**Interval Time:** Time since the last response that was reinforced. FI-1 first response after every minute. FI-10 first response after every 10 minutes. Cooldown timer.

Both schedules can reinforce either fixed or variable behaviours:

- **Fixed/Constant:** Conditions are held constant. Every 10 minutes, 10 responses, set amounts.
- **Variable:** Conditions are variable. VR-10 average of ten responses. VI-10 first response after every 10m on average.

**Four basic schedules of reinforcement:**

<b>Fixed Ratio (FR-#)</b>	<b>Variable Ratio (VR-#)</b>
<b>Fixed Interval (FI-#)</b>	<b>Variable Interval (VI-#)</b>

### Fixed Ratio

Ineffective if the ratio of behaviours to rewards is too high. Too high = ratio strain, no more responses.

Follows a “pause and run” pattern for behavioural responses. Pauses between each run of responses. Lack of motivation leads to procrastinating behaviour in FR.

### Variable Ratio

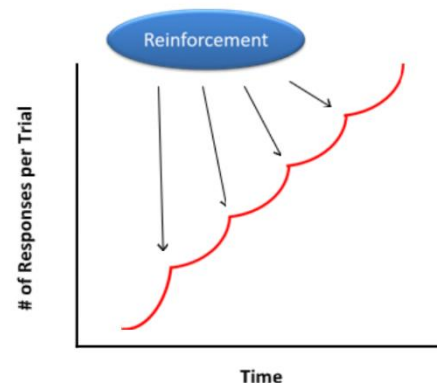
Gives reinforcement after a set average number of responses. Like playing 200-500 slot games before a reward.

Can support a high response rate of behaviour.

Slope tells the average number of responses before reinforcement. VR-10 is steeper than VR-40.

### Fixed Interval

Deliver reinforcement after a fixed interval of time.



After each reinforcement, there's a pause, then ramps up before the next reinforcement.

### Variable Interval

Deliver reinforcement after a set average amount of time. At any time, but you have an idea of how often. Steady rate. VI-2 is steeper than VI-6. More responses = steep.

Learning is more robust on a partial rather than a continuous reinforcement schedule. Once reinforcement stops occurring, responses decrease. Partial, it's not immediate that responses should decrease. Over a long period, partial is needed.



## **Chapter 4 – Instrumental Conditioning**

Primary reinforcers – Food, Water, Etc

Secondary reinforcers – Stuff you can buy  
Food, Water, Etc with.

Primary would be the good, Secondary  
would be money which you can buy the  
good with.

Delay of gratification has to do with a  
person's ability to deal with doing a task  
now but being rewarded later. Difficulty  
with this tends to lead to difficulty in coping  
with stress and frustration later as adults. In  
adults, it leads to substance use and  
addiction. The immediate satisfaction of  
drug use overshadow the satisfaction of  
abstinence.

Shaping works from Step A to Step Z. You  
add more steps AFTER the initially required  
ones. Chaining works from Step Z to Step A.  
You give them a requirement but add  
obstacles for them to overcome before  
completing that initial requirement.

If response increases, it's a positive  
contrast. If response decreases, it's a  
negative contrast. If you increase/decrease  
reward.

Overjustification Effect displays how  
changes in presentation of rewards for  
behaviours already naturally performed,  
alter the perception of the behaviour.

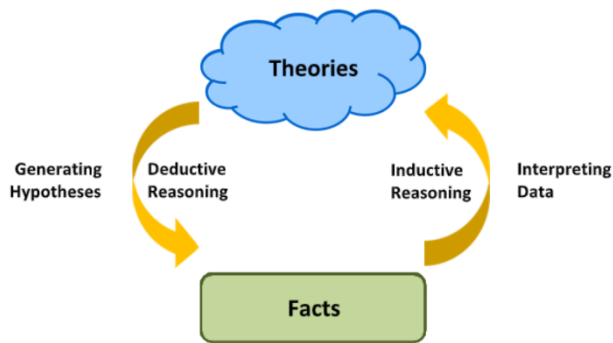
## Problem Solving and Intelligence

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

- Ability to perform cognitive tasks
- Capacity to learn from experience and adapt
- Problem solving ability is a reliable indicator of intelligence

**Deductive Reasoning:** Works from ideas and general information to arrive at specific conclusions.

**Inductive Reasoning:** Moving from specific facts and observations to broad generalizations and theories.



**Functional Fixedness:** Our difficulty seeing alternative uses for common objects

**Reliability:** Produces the same results if one person takes it multiple times.

**Validity:** Actually measures the trait it is supposed to be measuring.

- Linguistic – Verbal
- Mathematical – Logical
- Rhythmic – Musical
- Spatial – Visual
- Kinesthetic – Bodily
- Interpersonal
- Intrapersonal
- Naturalistic

Weschler Adult Intelligence Scale (WAIS)

Weschler Intelligence Scale Children (WISC)

Genetics and Environment both impact intelligence and their impacts are yet to be determined

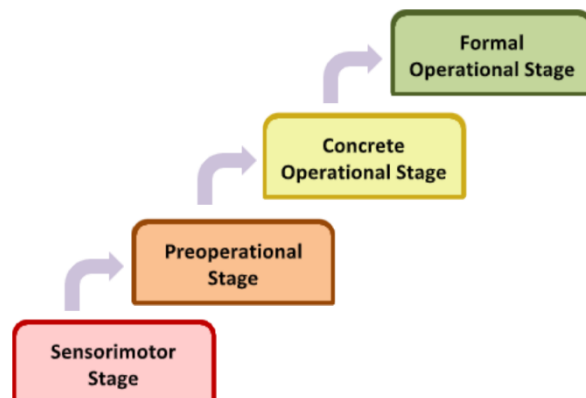
The Flynn Effect: The observation that raw IQ scores have been on the rise since 1932.

Increased Health, Quality of Life, Access to Info, etc. No one knows why the Flynn effect exists.

Schema: A mental framework for interpreting the world around us. Schema of young children are not developed.

Assimilation: Incorporation of new information into existing schemas.

Accommodation: Modifying existing schemas to fit incompatible information.



**Sensorimotor:**

- Lasts till 2 years old
- Begin to affect change in their environment
- Object Permanence: Realization that objects continue to exist when no longer visible.

**Preoperational Stage:**

- 2-7 years old
- Object Permanence mastered

**Egocentrism**

Has difficulty understanding world from a perspective other than their own.

**Seriation**

Inability to logically order a series of objects

**Reversible Relationships**

"I have a brother but my brother doesn't have a brother"

**Conservation**

They think there's more liquid in one glass simply because it is taller (yet thinner)

**Concrete Operational Stage:**

- 7-12 years old
- Mastered OP, Ego, Ser, Rev, Cons.
- Childs schemas are still concrete
- Unable to think in abstract terms and reason based on hypothesis
- Abstract ideas are taught after age 12

**Formal Operational Stage:**

- 12+ years old
- Understand abstract concepts, hypotheses, fantasy

Some children develop skills out of order

Relies too heavily on language abilities

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

Availability Heuristic: Our tendency to make decisions based on the information that is more quickly available to us.

Representativeness Heuristic: Our tendency to assume what we are seeing is representative of the larger category we have in our mind.

Measuring intelligence accurately is prone to error and is difficult. How to provide a definition and how to measure?

## Language

- Only human communication is considered 'language'.
- Language is regulated by the rules of grammar.
- Language is arbitrary.
- Lack of resemblance between words and their meaning.
- Language is productive. Can be combined/put together in many ways.
- You think in language

### The Whorf-Sapir Hypothesis

Language influences our thoughts and the way we perceive and experience the world.

Difficulty understanding numbers supports this hypothesis.

Recognizing different relatives with similar labels counters the hypothesis.

### Structure of Language (Grammar)

Morphemes: Smallest unit of sound that contains information. Often a word, but some words contain multiple morphemes.

Phonemes: Smallest unit of sounds in a word.

Syntax: The rules that govern how words in a sentence are put together. Also known as grammar.

Sentences can be syntactically correct without any semantic meaning.

## Development & the Segmentation Problem

12 wks	Makes cooing sounds
16 wks	Turns head towards voices
6 mos	Imitates sounds
1 year	Babbles
2 years	Uses 50-250 words; uses 2 word phrases
2.5 years	Vocabulary > 850 words

Language explodes in complexity between 1.5 to 6 years of age.

Segmenting individual words is difficult in the speech of a foreign language.

Speech segmentation ability in infants predicts vocab size in childhood.

### Universal Phonetic Sensitivity

The ability of infants to discriminate between any sounds they're tested on. Even from non-native languages.

Infants can distinguish between more phonemes than adults.

Children develop phonemic sensitivity based on the language they grew up with.

Heat-turn procedure is used to test for phonemic sensitivity in non-verbal infants.

### Theories of Language Development

Children learn through Imitation and Operant Conditioning.

Lack of early social interaction leads to an inability to develop language skills.

Children's language development is too fast for it to be developed by social interaction alone.

Overextensions categorize objects too broadly.

Underextensions categorize objects too specifically.

Language Acquisition Device: An innate mechanism, present only in humans, that helps language develop rapidly according to universal rules.

Congenitally deaf children develop a universal sign language without formally learning it.

Infants' brains are wired to listen to speech, even before understanding language.

### Animal Communication

The Waggle Dance in honeybees communicates the location of food sources

Waggle Phase:

Distance of a waggle -> Distance from food

Angle of waggle -> Direction of food

Upto 100 waggles.

Return Phase: Back to their initial spot.

Washoe could communicate with sign language, but without systematic grammar. Could communicate requests.

Sarah could communicate using symbols, but not as productively as in human language. Large vocab, could answer questions. Could not generate new sentences.

Kanzi learned lexigrams through immersion and not the typical classical conditioning. Utilized full immersion. Could communicate some novel requests and demands, but with very limited grammar.

Language is a defining characteristic of human cognition.

### Chapter 5

Overregularization: "he runned home"

Semantics – Meaning contained within

Perceptual Narrowing – Losing the ability to distinguish between contrasts in sounds not used in native language

Still-face Procedure: Starring at a 2/3 month old will get them distressed because they expect facial expressions.

Social smile at 2 months. Smile at social interaction.

Holophrastic Phase: Where a single word is meant to indicate the meaning of an entire sentence.

Receptive words are words kids understand but can't use themselves.

Pragmatics – the understanding and use of appropriate communication develops through conversational cooing and vocalizing with parents. Next comes the holophrastic and word spurt phases with rapid vocab growth.

Overextensions last longer in production than comprehension.

Telegraphic Stage – Only important words are used "where teddy"

## Categories and Concepts

- Attention helps focus mental resources on something
- Memory recalls stuff you need

Cognitive ability to put stuff into a category helps you efficiently process incoming data stream and make appropriate responses

Without the ability to categorize, every decision becomes overwhelming. Unable to draw connections with the past.

Categorization is ever-occurring and often intuitive.

## Function of Categorization

- Classifications groups dissimilar objects into the same category.
- Understanding identifies the intentions of a situation.
- Predicting uses past experiences to know what to expect.
- Communication uses specific words to describe ideas efficiently

Illusion of the Expert: The feeling that a task must be simple for everyone because it is simple for oneself.

## Prototype Theory

We categorize objects by comparing them to an internal “best” representation of a given category.

Prototypes are the average representation of all personal experiences.

New objects are compared to the average representation in Prototype Theory.

Can't explain why internal representations change over time.

## Exemplar Theory

We categorize objects by comparing them to every previously stored experience (exemplar) in a given category.

Exemplars are individual examples that we compare to for categorizing novel stimuli.

Exemplar theory can equally explain why we respond quicker to more familiar birds.

Diagnoses influenced by more recent experiences is evidence for Exemplar Theory.

Prototype Theory can explain simple categorization better than Exemplar Theory.

## Development of Categorization

Young children (3/4) can understand and generalize categories.

Children can understand hypothetical categorization as well.

Children have an understanding of the innate properties of a category. They know you can make stuff out of other stuff but can't turn one thing into another. We have a limited understanding of categorization in children.

## Animal Categorization

Baboons can be taught to classify objects with high accuracy. Can also be taught to classify using more abstract rules.

Animal categorization may not necessarily demonstrate language ability.

## Categorization explains the social phenomenon of stereotyping

## Attention

Attention allows you to navigate you through your surroundings.

Operational definitions are necessary for testing cognitive models.

Phenomenon -> model -> Hypothesis

Defining attention is a challenging task.

“Everyone knows what attention is. It is taking possession by the mind of one out of what seems several simultaneous possible trains of thought” – William James

Selection: The act of attending to an object to select it apart from the unattended objects.

Attention is an active process that helps us attend our goals.

When irrelevant information overwhelms us, we get distracted.

## Automatic and Controlled Attention

Automatic Processes: Involuntary “capture”. Fast, efficient.

Controlled Processes: Conscious attention. Slow, effortful.

Our attentional resources are limited and must be controlled carefully. Can’t multitask.

Salient information captures our attention automatically. Piece of information that naturally pops out to you. Automatically captures your attention.

Consciously effortful tasks can become automatic through practice.

## Spotlight Model

Conscious visual attention focuses like a spotlight. Attention can be hijacked by automatic processes to avoid danger.

Objects within your spotlight are more strongly attended to. Faster reaction time, higher accuracy.

Curing paradigms test the Automatic Processes of attention.

Our attentional spotlight is automatically attracted to cues. Attention shifts faster than the eye. Attention does not immediately rely on sight.

## Filter Models

We use auditory cues to filter target sounds from background noise. Our ability to single out audio is based on physicality of the voices.

Filters suppress the noise while spotlights enhance the stimulus.

Info → Filter → Further processing

The (Broadbent’s) Single Filter Model of attention is based on the physical characteristics of stimuli. Info that didn’t pass the filter was no available anymore.

Only info that is attended is filtered through for deeper processing.

Subjects remember nothing about unattended information.

Some info can still be processed, even when not actively attended to.

Von Wright: Subjects show a response to unattended information.

If highly relevant, unattended info can “break through” the attentional stream.

Breath Through: Participants remember unattended info.

The (Treisman) Dual Filter Model of attention includes the semantic filter for meaningful stimuli.

Info goes through a physical (early) filter where only the most clear and audible info is passed through. The semantic (late) filter evaluates the info for meaning and relevance and discards the rest. Also explains Break Through.

### The Stroop Task 1935

Pushes our attention skills to the limit.  
Creates an effect that is almost impossible to avoid.

Manipulates the congruency of text colour and text meaning.

Congruent: **RED**

Incongruent: **BLUE**

Demonstrates that attention is facilitated by stimulus relevance.

Proportion Congruent Manipulation:  
Change the ratio of congruent to incongruent trials.

75% Congruent → Increased Stroop Effect  
25% Congruent → Decreased Stroop Effect

Stroop Task shows that automatic processes can be consciously controlled.

Auto: Word reading influences performance even when the word is to be ignored.

Controlled: People can adopt consciously controlled word reading strategies that modulate the Stroop Effect.

### Visual Search Paradigm

Set Size: The number of items to search through.

Set Size Effect: Increase in difficulty as set size increases.

Single feature search tasks are relatively easy. Colour features really stand out.

Pop-out Effect: When the object of a visual search is easily found, regardless of set size. Easily induced by colour.

Conjunction searches use two or more features to create a more difficult search.

Despite the complexity of features, we perform visual searches everyday with ease.

### Contextual Cueing

Context cues our attention and improves our reaction time.

Attentional errors cause inconveniences every day. Serious attentional errors cause mental health problems.



## **Chapter 6 – Attention**

Bottom-up processing: Reflexive reaction

Top-down processing: Manually directing your attention to something to meet a goal.

Orienting is the act of moving attention across a scene.

Over attending: Looking at what you are doing

Covert orienting: Looking at something but your attention is somewhere else.

Inhibition of Return: When you're looking for something, the brain disregards stuff that you've already noticed and concluded that it's not what you are looking for.

Cocktail Party Effect: When engaged in a task our attention is still able to attend to relevant stimuli, like your name being called

Spatial Cuing Paradigm: Measures the movement of attention across a scene and factors involved.

Inattentional blindness demonstrates that our limited attentional processes can be susceptible to missing out some very important and salient things. When you are strongly focused on one thing, you will likely miss other important things going on in the scene.

Meaning can be processed pre-attentively or before attention is selectively committed.

Change Blindness paradigm: Our difficulty with detecting change.

Both the Later Filter Models and the Attenuation Model may be able to account for the cocktail party effect.

Flashbulb Memories: Highly detailed and vivid snapshot of a moment. Not always as accurate as they may seem.

Schema (Visual Search): The range of plausible objects and likely configurations within particular scenes. Can help guide your search.

## Memory

Cognitive psychologists study how our mental processes make us sentient beings.

### Metaphors

- Video camera – accurately perceives audio and images
- Filing cabinet – memories stored in files
- Computer – Specialized components are responsible for handling different memories

Memory metaphors misleadingly simplify memory as perfectly stored and easily retrieved.

**Data:** Stored data is identical to input  
Retrieved data is identical to input

**Memory:** Stored memory includes personal details and interpretations.  
Retrieved memory may be altered or lost

### Basics of Memory

Psychologists study how memory is acquired, encoded, stored, and retrieved.

One memory can act as a cue to signal another memory into consciousness.

Early work on memory noted how each memory cue is linked to the cue before it.

Cueing is important to encoding specificity.

Memory models involve an encoding phase, followed by a retrieval phase.

Recall Test: What you remember

Recognition Test: What is new/old

Both test ability to remember items from encoding phase.

*Our ability to recall recently encoded information decreases rapidly over time.*

**Forgetting Curve** describes the rapidly decreasing recall rate.

### Multi-Store Model

Suggests that memory has a temporary and permanent storage. Short/Long Term.

Stuff goes to ST then LT.

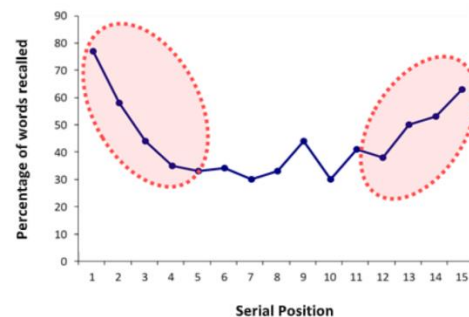
Short-term Memory Capacity: 7 +/- 2

Organizing items into meaningful chunks expands the capacity of short-term memory

Memory models can be tested through psychology experiments.

### Serial Position Curve

Memory is strongest for items at the beginning and end of a list.



Increased rehearsal of early items over later ones leads to the Primacy Effect. First stuff added to ST memory, more rehearsal. Rehearsing items increases their chance of being transferred to LT memory.

Items in the middle of a list have less opportunity for rehearsal and LT transfer.

Recency Effect: The more recent items replace the previous items to occupy short-term memory.

Increasing time between item presentations increases: (Primacy Effect Enhanced)

- Amount of times items can be repeated
- Probability of item being stored in LT
- Performance recalling first couple items

Disrupting the ST memory with a distracting event can diminish the recency effect.

The Multi-Store Model reliably explains the Serial Position curve.

### The Levels of Processing Principle

Information is encoded at different levels of Processing.

Shallow level:

- Encode physical characteristics.
- Encoding requires little effort.
- Poor memory performance.

Deeper level:

- Encode semantic characteristics.
- Encoding requires significant effort.
- Better memory performance.

Memory performance improves for increasingly deeper levels of processing.

Levels of Processing: The more we try to organize and understand the material, the better we remember it.

### Encoding Specificity

Environmental cues are encoded together with memories for items and events.

ES: Memory encodes all aspects of an experience. These aspects can influence memory performance in the future as acting as specific cues for the memory being recalled. Not a pure/isolated experience.

Preserving encoding context improves subsequent recall of a memory.

### Memory Illusions and Fluency

Our memories are prone to error!

Our susceptibility to false memories indicates that memory is a reconstructive process.

Repeated imagination of any event can lead to the event being falsely remembered.

Our memory can confuse false, imagined events with actual, performed events.

Memory is reconstructive and constantly open to re-interpretation. We experience familiarity on many occasions.

Fluency: The ease with which an experience is processed, some experiences are easier (more fluent) than others.

Attribution: Judgement tying together causes with effects. Used to make sense of our feelings of fluency.

Barlett: Memory is a reconstruction, not stored. Memories exist by reconstructing them when we need to remember them. Memory is a constantly reconstructed compilation of perceptions and experiences

Understanding how memory is processed can improve our own memory performance

Misinformation effect: When new info is thought to be part of an old memory and false memories are formed.

**Source monitoring errors:** Failing to recall true origins of memories. When associating familiarity and ease of processing. **Reality monitoring:** discriminate false/true memori

## **Chapter 7 – Memory**

**Phonological loop:** Original notion of short-term memory. 7 +/- 2 items. Maintains info that can be rehearsed verbally.

**Visuospatial sketchpad:** New, thought to temporarily represent and manipulate visual information.

**Episodic buffer:** New, thought to draw on the other buffers as well as on other stored long-term memories. Engaged when remembering specific past episodes.

**Central Executive:** Coordinates and manipulates information that is temporarily maintained in the buffers.

**Sensory Memory** represents brief, transient perceptual and physical info about immediate experiences and is not limited by attention. These memories decay after 50ms. Large capacity.

**Short-term memory:** Info selected for further processing in sensory memory is held in conscious awareness for short periods of time, but not permanently. Rehearsal of info increases the amount of time it can be held online. Store can be increased by chunking.

**Working memory:** Refined version of short-term memory and has 3 buffers.

**Declarative memories** are an example of prototypical conception of memory. You can recall what you remember about an event. General or semantic that are not tied to a place/time.

**Episodic memories** are tied to a particular place and time, personal.

**Nondeclarative** memories are memories that are difficult to articulate. Implicit and procedural, apparent in functioning.

**Long-term memories** appear to be placed in a more distributed fashion throughout the cortex. The hippocampus might assist in coordinating the activation of distributed cortical regions that are involved in representing parts of the whole memory.

**Schemas** are knowledge structures and expectations built through experiences and memories and aid in navigation.

**Evidence** for the **multi-store model** comes from the free recall paradigm.

Enriched Encoding: Self > Meaning > Rhyme > Case

**Decay theory:** Forgetting occurs because memories fade with time. Explains short-term but not long-term.

**Interference:** A cue that was once held for one memory may become associated with a new memory and lose its effect on the initial memory.

**Proactive interference:** If the interfering info was learned prior to the specific memory.

**Retroactive interference:** If new info interferes with the retrieval of old info.

**Repression:** Forgetting memories as a defense mechanism.

**Mnemonic strategies** are tricks used to make to-be-remembered information more relevant and easier to remember. Self-referent effect, deep processing.

**Transfer Appropriate** Processing suggests memory is enhanced when encoding and retrieval utilize the same or similar processes

## Forming Impressions

Through life and experiences we are already experts in assessing behaviour through forming impressions.

For every observed behaviour, there are many possible motivating factors.

## Attribution Theories

We quickly and automatically form impressions based on observed behaviour.

We make inferences based on three variables: Correspondence Inference Theory

### 1. **Degree of Choice**

We consider to what degree a person had a choice in acting the way they did.

### 2. **Expectation**

We consider whether an observed behaviour is either typical or uncommon. Typical behaviour tells us less.

### 3. **Intended Consequences**

We consider the intentions and motives behind a particular behaviour.

Covariation Theory: How a person's behaviour can be attributed to either personal dispositional or situational circumstances:

Consistency: Does the individual usually behave this way in this situation?

Distinctiveness: Does the individual behave differently in different situations?

Yes: Situational              No: Dispositional

Consensus: Do others behave similarly in this situation?

Yes: Situational              No: Dispositional

## The Fundamental Attribution Error

We rely more on dispositional factors than situational factors for interpreting behaviour.

FAE: Tendency to over-value dispositional factors for the observed behaviours of others while under-valuing situational factors.

We are more susceptible to the FAE for others' behaviours.

Actor Observer Effect: We are much more aware of the situational influences when perceiving our own behaviour.

FAE is not universal across all cultures. FAE is diminished in collectivity societies.

The Above Average Effect: We self-attribute dispositional factors to success and situational factors to failures.

We are biased in believing we are above average on things that matter to us.

## Cognitive Heuristics

Accelerate the processing of social situations. Provide useful shortcuts in processing social cues, leading to biases.

Representative Heuristics consider how well a behaviour fits with a certain prototype. We often discount probability in favour of a representative prototype.

Availability Heuristic considers the experiences most readily available in memory. The availability of flaws in memory influences our perception of an experience.

## Relationships

Attraction research. Attractiveness is governed by several key factors.

**Proximity:** We are more attracted to people who are close in proximity to us. Functional distance, where interactions occur. We tend to like the people we anticipate interacting with.

**Familiarity:** We are more positive toward familiar than unfamiliar stimuli. We rate faces as being more attractive the more familiar they are to us.

**Physical Attractiveness** is used as an indicator of personal characteristics. We think attractive people are kind. Attractive children are rated as more intelligent than unattractive children (Clifford and Hatfield study).

**Other's Opinions:** We like those who like us back, especially when we have low self-esteem. Previous impressions of likeability influence novel impressions of likeability. When opposite to the initial impression, the new impression is strongly influential.

Walster study showed that women with lowered self-esteem rated men as better looking when asked out by them.

We are all at least somewhat biased when forming impressions of others.

**False Consensus Effect:** The belief that your thoughts are similar to others.

**Illusory Correlation:** When individuals believe that two variables are related even though there is no evidence for that relationship. Relevant to the formation of stereotypes.

Pervasive stereotypes tend to affect example availability.

Implicit Association Test is a speeded categorization task where participants categorize stimuli into four different categories using two response keys.

## Influence of Others 1

Our thoughts and behaviours are influenced by the people around us. Social psychology is not as intuitive as it seems.

### Presence of Others

Behaviours performed in a group are different from behaviours performed individually.

**Norman Triplett** found that cyclists raced faster in a group than alone. Also found that children worked faster in a group rather than alone.

**Co-Actor:** Individuals performing the same task.

**Audience:** A group of people watching an individual perform a task.

**Social Facilitation:** The increased performance that occurs in the presence of co-actors or an audience.

However, the presence of others can sometimes hinder, rather than help, a performance. Or even not help at all.

**Zajonc's Resolution:** Proposed solution to Social Facilitation. Increases arousal. Presence of others increases arousal to improve performance on well practiced tasks. Presence of others decreases performance on complex tasks.

*Group presence hinders complex task performance, but facilitates well-practiced ones.*

## Social Learning Theory

We learn appropriate behaviours by modeling & imitating the behavior of others

Behaviour you learn from others do not always require explicit reinforcement to develop.

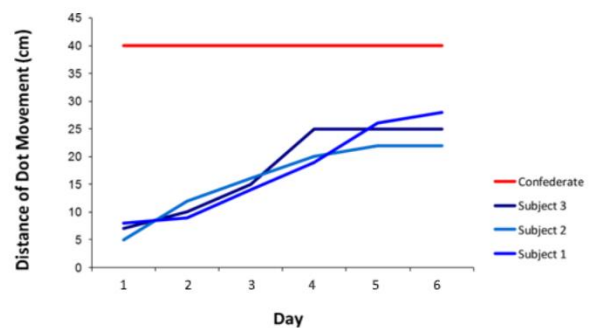
(Bandura) Bobo Doll Experiment: Individual children acquired behaviours through observation, without reinforcement. They beat the shit out of the Bobo Doll. Children mimic observed behaviours, even when afflicting harm to other people.

### Conformity

Conformity has powerful control over our behaviour.

**Sherif** and Norm Formation: The autokinetic effect causes us to imagine movement that never occurred. The presence of others' opinions artificially influences perceived autokinetic movement.

Norm Formation leads to convergence in behaviour, even in the presence of outliers.



**Soliman Asch** investigated why people so easily converge toward a norm. He had a subject match a pair of lines with the presence of confederates. 75% of participants conformed to the group's incorrect answer **at least once**. Average 37% responses conformed.

**Normative Function:** The role of others in setting standards for our conduct based on a fear of rejection.

**Comparative Function:** The role of others in providing information about an ambiguous situation.

Conformity of behaviour is a result of both.

### Group Dynamics

**The Risky Shift:** Group decisions were typically riskier than the mean of the prior individual decisions. However, groups do not ALWAYS shift to riskier decisions than individuals.

**Group Polarization:** Group decision making strengthens the original inclinations of the individual group members. Group consensus is pushed to the extreme of the individual decisions. Can explain various attitudes, decisions, and popular opinions.

**Groupthink:** A group decision making environment that occurs when group cohesiveness becomes so strong it overrides realistic appraisals of reality and alternative opinions. Mob mentality. Powerfully influences the group's perception of themselves in the world. Pressure to conform is high. Those who disagree are rejected from the group.

Preventing groupthink:

- Be impartial
- Critical evaluation let people disagree.
- Subdivide the group
- Provide a second chance

### The Bystander Effect

**Kitty Genovese:** The presence of other witnesses led to a diffusion of responsibility to act. Fear of personal injury was a reason.

Is it an emergency and should I be the one to respond?

The more people present, the less likely a single person takes to realize an emergency.

**Collective Ignorance:** When each individual in a group see nobody responding in a given situation, they conclude that the situation is not an emergency.

(Darley) **Diffusion of Responsibility:** In deciding whether we have to act, we determine that someone else in the group is more qualified.

*Being direct about asking for help avoids the Bystander Effect.*

Seeing helpful behaviour increases your probability of helping others in the future.

**Social Loafing:** Individuals seem to be less motivated when working in a group than when working alone. Less effort.

In larger perceived group sizes, people unknowingly make less noise than when alone.



## Influence of Others 2

### Obedience

Milgram's experiment involved teaching a subject to use shock punishment for learning. Teachers must give progressively higher shocks for incorrect responses from learners. Teacher is told to continue even if the learner is in pain.

65% of all subjects continue giving shocks until the end of the experiment.

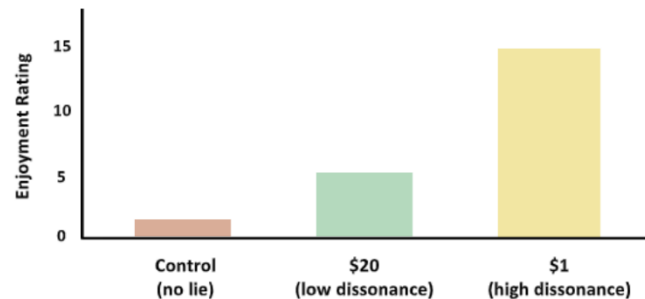
- People display strong obedience, even to minimally powerful figures of authority.
  - We are terrible judges at predicting our own behaviour.
  - The ethics behind the experiment are highly controversial.
- The prestige of an institution influences the level of obedience in subjects. 50% in a warehouse.
  - The proximity between Teacher and Learner influences obedience levels in subjects. The closer, the less people that were willing to continue.
  - The proximity between experimenter and teacher influences obedience. Farther, less obedience.

Hofling used real nurses to test obedience to a prohibited requires from an unknown doctor. We are not accurate judges of our often irresistible tendency to obey authority 5% vs 95%.

### Cognitive Dissonance

Our attitudes aren't always accurately reflected in our behaviours.

Does the incentive of pay for a false opinion affect our true opinion of an experience?



Thinks it's boring -> Lie -> Large Dissonance

Thinks it's fun -> No Lie -> Reduce Diss.

The \$1 lads change their initial mind so it's a reduced dissonance. The \$20 lads are like "yeah I'm just doing it for the money idc about the dissonance".

Attitudes are less likely to change when external motivations overjustify the behaviour. Over justification can trick people into discontinuing a behaviour.

### Stanford Prison Experiment (Zimbardo)

Studied people's behaviours under the role of authority.

Participants were mock arrested and sent to a mock prison, supervised by mock guards. Criminal check, Psychology screen, Anti-social behaviour screen.

The experiment ended early due to the sadistic behaviour of the assigned guards. Guards displayed dehumanizing behaviours toward their prisoners.

Demonstrates the shocking power of assigned roles on behaviour.

Deindividuation: In a group situation, the loss of a sense of personal responsibility and restraint. Leads to unrestrained anti-normative behaviour. Explains the prominence of vandalism in large cities.

### Persuasion

- The most persuasive communicators have high credibility.
- They are also both attractive and relatable to their audience.

Similarity or Credibility? Which is more persuasive? (Geothals and Nelson):

- Lifestyle Choices → Similarity
- Objective Fact → Credibility

Being more persuasive:

- Eye Contact
- Concise Speech
- Speech Speed
- Straightforward

How you frame the message - one sided or two sided. If the audience is already leaning to your position, one sided is more effective. Two sided if the audience is against your position.

**Central Appeal:** Well reasoned, factual, two-sided arguments. Effective for academic audiences.

**Peripheral Appeal:** Well presented, easy to understand messages. Effective for non-academic audiences.

### Techniques in Persuasion

Officer Scott:

- Assumed identity of authority figure
- Established credibility using jargon
- **Foot in the door effect:** Used gradual escalation of demands to increase compliance.

Asking for a small request made subjects agree to a larger, typically denied request. Every request is considered in relation to the previous request, rather than the first.

Low Ball Technique: An escalation of the terms of an agreement after someone has already agreed to comply.

Agreeing to do something makes you more likely to attend them.

Cognitive Dissonance is the discomfort experienced when holding two or more conflicting cognitions, and these cognitions can be ideas, beliefs, values, or emotional reactions. Can lead to alterations in our beliefs/actions in order to reduce this discomfort.

## **Chapter 9**

### **Helping Others**

Altruism: An unselfish regard for the welfare of others, a willingness to put your neck on the line to help.

Norm of Reciprocity: We are expected to reciprocate when someone else treats us well. We tend to return favours.

Norm of Social Responsibility: We are expected to contribute to society's welfare in a positive way.

Daniel Batson: Empathy-Altruism Hypothesis: That altruism results from empathy. When people are equally likely to help someone even though they may not get anything out of it, it supports the hypothesis.

Negative State Relief Model: We help because we would feel distressed (and guilty) if we didn't.

Helping: In western societies, the focus tends to be on individualism. We expect others to take responsibility for themselves and so there is less drive to help. In collectivist societies, people tend to be more likely to help.

Males are significantly more likely to help females. While females are equally likely to help either.

We are more willing to help those whose problems are beyond their control. Like children and animals.

Relational Aggression: Personal interactions. Engaging in acts to make people dislike someone. Spreading rumours or ignoring them.

Hostile Aggression: Directly confrontational behaviours – hitting someone or yelling at them.

Children: Girls are much more likely to engage in relational aggression than boys.

Men are seen as more aggressive because their aggression is easy to see. Physical fights. While women's aggression is subtle. Social pressures and expectations are to be considered when judging.