Introduction To Psychology I Notes - Lecture notes, lectures 1 - 13

Introduction to Psychology I (Macquarie University)

Introduction to Psychology I

Chapter 1 – Scientific Thinking

What is Psychology?

- Psychology is the scientific study of how people think, feel and behave.
- Sigmund Freud is the 'father' of psychoanalytic theory → whereby people decisions are driven by subconscious forces or desires.
- In contrast, Ivan Pavlov who was a 'behaviourist,' basically depositing that all behaviours are learnt, and we learn what are called **contingencies,** and repeated exposure to certain associations can help alter behaviour.

History of Psychology

- **Zeitgeist** is a word that means what is the kind of social context, particularly relating to knowledge generation or social factors that an idea emerges in.
- Psychology is the study of the **PSYCHE,** the Ancient Greek word for 'soul.' The term 'psyche' today could either mean soul or mind.

Greek Origins of Western Thought

1.

- **Pythagorus (580-500 BCE)** is the first person to connect physical events **(tones)** to psychological events **(pleasure)** → psychological responses to physical activity.
- Pythagorus believed that the world can only be explained by REASON and not the senses. He was the first *with a clear cut mind-body dualism in Western thought.*
- He also began the tradition of imbuing senses as being inferior to rational or higher thought.

2.

- **Plato (427-347 BCE)** combined Socratic Method with Pythagorean mysticism. Socratic method is a form of questioning where an idea is taken apart by a series of questions which is set to reveal its foundations.
- Plato also educed the **Theory of Forms,** which asserts that objects in the material are inferior representations of objects in the world of pure forms (ideas). Plato hence believed that **true knowledge is attained by grasping the forms (ideas) themselves → This is achieved by ignoring senses and sensory experience.**

3.

- **Aristotle (384-322 BCE)** was the first to examine topics such as; memory, sensation, sleep, dreams, geriatrics (ageing) and learning.
- He thought that essences could only become known by studying nature. Senses bring in information. This is done by studying many examples of types of events or objects, hence refuting the claim of the **Theory of Forms.**
- Aristotle was termed a **Rationalist Empiricist →** the mind must analyse information from the senses to produce knowledge.
- Aristotle explained physiological events through biology → he was the first physiological psychologist.
- He emphasised purpose, which is teleology.

- His main contribution to psychology, however, is that he *postulated several laws of Association with respect to memory.* Associationism is the basis of modern theories of Learning.
- Aristotle also established deductive logic, which established a rigor in analytical thinking → that is, you could pull apart an argument and see if it really made sense.

The Dark Ages in the West (400s – 1300s CE)

- Greek learning largely lost to the West.
- Dominant movements and writings of the time based on mysticism, superstition and anti-intellectualism → more so about emotive comfort rather than critical thinking.
- The preservation of ancient Greek learning was only carried out by Islamic scholarship, hence the availability of such writings despite being lost to the West.
- This period *effectively stopped open inquiry concerning the nature of human beings.* Rather, the **role of human reason was down played in favour of adherence to faith as espoused by the Church.**
- Towards the end of this period, the rediscovery of Aristotle's work lead to a re-awakening of discussion and inquiry.

Renaissance Humanism (1400s - 1600s CE)

- This period gave rise to social and intellectual focus on human beings and human activities.
- Four main themes are prominent:
  1. Individualism
  2. Personal religion
  3. Interest in the past, Greek and Roman writers.
  4. Anti-Aristotelianism
- During this period, establish dogma (doctrine) was no longer unchallenged.
- This era brought about the rise of Skepticism → intellectualised Aristotelian religion of the day was challenged.

Francis Bacon (1561 – 1626 CE)

- Bacon recognised only empirical observation as the ultimate authority in matters scientific.
- He also recognised that scientific endeavours should benefit society → practical knowledge was the rationale for expending public funds of science.

Renaissance Humanism (1400s-1600s CE)

- This was the period when social and intellectual focus turned onto human beings and their activities.
- Four themes were prominent in this period:
  - Individualism
  - Personal religion
  - Interest in the past → Greek and Roman writers
  - Anti-Aristotelianism – Rejection of Aristotelean thought
- Dogma was no longer unchallenged. E.g. Church teachings
- Rise of 'princely kingdoms' contributed to rejection of centralised control.
- Rise of scepticism (e.g. Petrarch, Montaigne) meant that intellectualised Aristotelean religion of the day was challenged.
- A time characterised by upheaval → birth of science.

Principles of Newtonian Science

1. God created but did not micromanage
2. Rather, the material world is governed by natural laws

3. He rejected Aristotle's 'final cause concept' → he asserted that there were intermediate clauses, and things followed from that.
4. Accepted Occam's Razor → which is the assertion that a theory should be as complicated as necessary to explain a phenomenon but no more complicated than necessary.
5. Knowledge is imperfect because of limitations of human beings.
6. Classification (naming) is not explanation.

Observation

Francis Bacon (1561-1626 CE)

- Stressed the observation of events.
- Desired no theories but only induction → A true scientist must come to their task without preconceptions.
- Bacon recognised only empirical observation as the ultimate authority in matters scientific.
- Scientific endeavours should benefit society → practical knowledge was the rationale for expending public funds on science.

Rationalism

Descartes (1596-1650 CE)

- Invented analytical geometry from observing flies in a room → wanted to be able to locate them exactly in 3 dimensions → **wanted exactness in measurement.**
- Wanted to establish human knowledge on the same certain basis as the truths of mathematics.
- Essentially, **he wanted to be able to identify the sure foundation of knowing.**
- From this foundation, all knowledge could be deduced.
- His method consisted of 4 rules:
  1. Avoid all prejudgement, all is up for examination
  2. Divide problems into as many parts as might be required to obtain a solution
  3. Analyse the parts in an orderly fashion → start with the simplest and work towards the hardest
  4. Be extremely thorough so as to leave no aspect unexamined
- Descartes came to the conclusion → **'Cogito ergo sum = I think, therefore I am.'**
- However, he also became convinced that certain ideas were so clear they must be **INNATE** → placed there by God.
- Descartes was **clearly a RATIONALIST** → that is because he emphasised the dominance of logical thought processes in the quest for knowledge.
- **Interactive Dualism –** the ancient Mind Body problem was brought into focus by Descartes. Clearly the body was necessary for existence which is necessary for thinking, yet the Mind did not work according to the same physical principles. The two interacted, but **HOW?**

Empiricism

Locke (1632-1704 CE)

- Locke opposed innate ideas → for him all knowledge came from '**experience'**.
- Ideas were simple mental images. They are produced by either sensation or reflection.
- The operations of the mind are innate. Its task is the arranging of the images/ideas, it does not create or destroy them.
- He maintained that humans are motivated by the seeking of pleasure and avoidance of pain.
- The mind was a **blank slate** or **'tabula rasa'.** This was in opposition to Descartes who emphasised the role of experience in creating knowledge. The mind did not come with all it needed. Experience was the missing ingredient.

Hume (1711-1776 CE)

- The science of man must be laid upon the foundation of experience and observation.
- Hume believed **the first step was careful observation** and then generalise from those observations.
- Knowledge begins from simple impressions by which he meant strong vivid perceptions.
- Once can never know reality directly, only the received perceptions.
- Hume asserted that a causal relationship is nothing more than a consistent co-occurrence of two events. Thus, **causation is primarily a psychological experience not necessarily a reality.**
- Hume had 4 conditions for 2 events to be causally related:
  1. Contiguous (together) in space and time
  2. Cause must precede the event.
  3. Constant union of cause and effect.
  4. Same cause for same effect.
- Human wanted **NEWTONIAN CERTAINTY for psychology.**

Kant (1724-1804 CE)

- Kant brought to the divide between the Empiricists and early rationalists a synthesis of ideas.
- Kant asserted that categories could not be derived from experience. They had an existence prior to observation.
- He postulated that though experience was critical, further analysis of the experience showed the operations of an active mind → you need both.
- For Kant → centre of the universe was the human mind.

Charles Darwin (1809-1882 CE)

- He asserted that survival of the best was viewed from the perspective of an entire species as a whole, **NOT focusing on the individual.**
- Individuals carry the traits that 'fit' the environment.
- **Survival of the BEST FITTED.**
- Darwin asserted that emotions are the remnants of animal emotions → remnants of by-gone survival needs
- Evolution is **the most influential theory in modern Psychology.**
- Darwin asserted that both humans and great apes descended from a common primate ancestor.
- Today, genetics has provided a mechanism for explaining the process of passing on traits.

SUMMARY

Reason / Ration → Descartes, Aquinas, Occam, Plato → **(Reason onto theory) Theory** → Hegel, Kant
Observation → Newton, Hume, Aristotle, Bacon, Locke → **(Observation onto data) Data**
Mathematics → Plato, Galileo, Newton

The aforementioned 3 categories (*Theory, Mathematics, Data)* make up MODERN EMPIRICAL PSYCHOLOGY.

Modern Theories of Psychology

Structuralism

- Zeitgeist of European psychology → what is the structure of the 'mind.'
- Shows a substantial affiliation with the philosophical speculations of the Rationalists.
- Characteristics:
  - Concerns the elements of the human mind
  - Used introspection as its main method of investigation
  - Edward Titchener is the founding figure of this approach

Functionalism

- Zeitgeist of US psychology → what is its practical us? That is, how can the research of the mind be used for the benefit of society?
- Prominent member was William James.
- Functionalism effectively is a **combination of evolution and pragmatism.**
- Characteristics:
  - Concerns the functions of the mind (not structure) → that is, how do mental processes aid adaptation to the environment.
  - Used all methods that would aid in studying the function of the mind.
  - Seeks to apply findings to improve personal life, education, industry etc.
  - Interested in individual differences.

Psychodynamic Perspective (Psychoanalysis)

- Sigmund Freud is the founder.
- Based on 3 assumptions:
  1. Actions determined by thoughts, feeling and wishes
  2. Much of mental activity occurs out of awareness (**collective unconscious**)
  3. Mental processes may conflict with one another
- Freud's assertion that symptoms could be the product of unconscious motives was truly revolutionary.
- Research has confirmed mental activity occurring out of our conscious awareness.

Behaviourist Perspective

- John Watson is regarded as the founding figure, but B F Skinner made substantial contributions.
- This perspective rejects any notion of a Cartesian dualism (body and mind) and follows Locke's concept of the **tabula rasa** or **blank slate.**
- The blank slate refutes the notion of **innateness.** In essence, this perspective embraces the concept that experience is the fundamental development of knowledge.
- Early behaviourists wanted to make psychology an empirical science which was void of assumptions → observable behaviour only.
- Study focuses on 2 types of conditions: 1. Rewards 2. Punishments → This is known as the **stimulus – response approach.**

Humanistic Perspective

- Carl Rogers is the founder.
- Emphasis on the actualisation of the self.
- Reaching ones potential is the goal of Humanistic approaches in therapy and other activities.
- This approach assumes the uniqueness of the individual.

- The approach utilises empathy and attempts to focus on the individual and is therefore often described as 'person-centred.'

Cognitive Perspective

- 'Partly a reaction to the dominance of Behaviourism and the emergence of modern computers the cognitive perspective regards unseen processes as legitimate areas of study for psychology.'
- The cognitive approach is interested in how people perceive, process, retrieve and utilise information.
- Cognitive psychologists are interested in how people process information and so have an affinity with the rationalists and their questions on how we know.
- The methods used are experimental but done in such a way as to infer mental processes which themselves are not observed.

Evolutionary Perspective

- In the same vein as the functionalists, the Evolutionary perspective asserts that human psychological traits and characteristics exist because they enable humans to survive.
- Therefore any study of human social or mental processes must take into account their evolutionary origins, e.g. the study of mating and aggression have been facilitated by an evolutionary perspective.
- The evolutionary perspective also acknowledges the important role of genetics and therefore kinship is influencing behaviour.
- This approach is criticised from a scientific point of view in that it is difficult to falsify.

Motivation

- **Motivation** is the 'driving force behind behaviour that leads us to pursue some things and avoid others.'
- Motivation concerns:
    1. What people want to do
    2. And the strength in which they wish to pursue it

Perspectives on Motivation

Psychodynamic Perspective

- Freud argues that we are motivated by internal tensions states. Focuses on a biological basis of motivation. **Sex** and **Aggression** are the two proposed basic drives by Freud.
- Other psychodynamic theories have added to these 2:
    1. The desire for non-sexual relations with others
    2. The desire for self-esteem
- This perspective is largely defined by its distinction between conscious and unconscious motives:
    - **Unconscious motives:** Are studied using the Thematic Apperception Test (TAT) which consists of a set of ambiguous pictures in which a person then has to come up with a story. Then, these responses are coded according to motivational themes (intimacy, power, achievement, affiliation).
    - **Conscious, self-reported motives:** May be obtained by asking 'achievement important to you?'
- It's been found that the correlation between conscious self-reported motives and inferred motives expressed in TAT stories is ZERO: e.g. **people who demonstrate high achievement motivation through stories don't necessarily report high motivation to achieve.**
- Both, however predict achievement:
    1. Achievement motivation assessed by TAT is more predictive of long-term entrepreneurial success than that assessed by self-report.
    2. If participants are told to do well on a laboratory task, then self-reported motivation is more predictive of effort and success than TAT-expressed motivation.
- How can both types of measure predict achievement behaviour but not each other? The solution is to distinguish between:
    1. **The TAT taps implicit motives** which are expressed over time without awareness.
    2. **Self-reports reflect explicit motives** which are activated when conscious attention is focused on a task or goal.

Behaviourist Perspective

- Although behaviourists prefer to avoid such terms as motivation that suggest a causal role for internal states, the theory of **operant conditioning offers** (if only implicitly) one of the clearest and most empirically supported views of motivation.
- Behaviourists prefer to focus on the relationship between **external events and observable behaviour,** and are reluctant to speculate on processes inside the organism.
- **Operant conditioning:** A type of learning in which the future probability of a behaviour is affected by its consequences. There are 2 types of environmental consequence which produce operant conditioning:
    1. **Reinforcers:** Strengthening a behaviour by instituting those consequences. (by increasing the frequency of the behaviour)

2. **Punishers:** Weakening a behaviour by instituting those consequences. (by decreasing the frequency of the behaviour)

- Implicit in the theory of operant conditioning is that we are motivated to repeat behaviours reinforced by the environment and to avoid behaviours that are punished.
- Yet learning theorists recognised that the internal state of an organism influences reinforcement. This was addressed by behaviourists through the concept of **drive –** all biological organisms have needs and unfilled needs that lead to **drives, which are defined as states of arousal that motivate behaviour.**
- Motivation stems from 2 things: **Drive** and **Reinforcement.** **Drive-reduction theory** asserts that deprivation of basic needs creates an unpleasant state of tension, motivating us to produce a behaviour that reduces that tension and returns our body to a normal state of equilibrium. This is compared to the body regulating process of **homeostasis.** If this behaviour is associated with drive reduction, it will be reinforced as it reduces the unpleasant state of tension.
- There are 2 types of **drives:**
    1. **Primary Drives:** are those which are innate (or biological) such as hunger, thirst and sex.
    2. **Secondary Drives:** are learned through conditioning and other learning mechanisms such as modelling. E.g. Desire for money; Desire for social approval.

Cognitive Perspective: Expectancy-value theory

- Views motivation as a combination of the value people place on an outcome and the extent to which they believe such an outcome is attainable.
- A study by Lynd-Stevenson in 1999 was aimed to see if individuals with high expectations and who place high value on obtaining a job are more motivated to get a job and will have more job-seeking activity. **Expectancy-value variables** are then related to future employment status, because individuals engaged in higher rates of job-seeking are presumed more likely to get a job.
- The study involved was a longitudinal study over 10-12 months involving 200 young unemployed people. Background and psychological variables were measured at initial interview were used to predict employment status 10-12 months later.
- Essentially, introduction of expectancy-value variables resulted in a significant increase of predictive power and a significant relationship between future employment status and predictor variables.
- Examination of individual predictors indicated that both job expectancy and job importance were notable predictors of future employment status. Both variables were instrumental in separating the three groups of employment status as follow-up:
    - **Job expectancy** was useful in separating the permanently employed from the unemployed and temporarily employed. This *suggests that* Individuals with high expectations of job expectancy will persevere with their job applications until they find a **permanent position.**
    - In contrast, **job importance** played a role in separating the unemployed from the temporarily and permanently employed. This *suggests that* those who place a high value on jobs are willing to take a job, **irrespective of permanency.**

Cognitive Perspective: Goal-Setting Theory

- States that conscious goals are desires outcomes that regulate our behaviour as humans and differ from our current situation.
- Latham and Brown's study in 2006 examined the application of goal-setting theory on student **self-efficacy, program satisfaction and performance** (GPA). It was random

assignment of 125 full-time students at a Canadian university. These students were assigned to 1 of 4 conditions:

1. **Distal (end of academic year) Outcome Goals**
2. **Distal (same as above) plus Proximal (end of each semester) Outcome Goals**
3. **Learning (process-oriented) Goals – coming up with ways to master knowledge**
4. **Do Your Best Goals (to find ways to ensure that the education experience was meaningful and satisfying)**

- All participants were given a self-efficacy questionnaire immediately after the goal setting intervention, and again at the end of the academic year. At the end of both the first semester and the academic year, a person's satisfaction with the MBA program was assessed.
- In regards to **self-efficacy,** the study found that when individuals have yet to master a task, a focus on the end result rather than the process for attaining it increases apprehensions of both failure and the disapproval from significant others. Differences in self-efficacy among conditions disappeared by the end of the academic year. This highlights the **danger of setting long-term distal goals.**
- In terms of **GPA performance**, proximal outcome goals were beneficial on tasks that are complex for people because of uncertainty… in an MBA program, the tasks are designed to be complex and ambiguous for most people.
- The setting of learning goals, by its very nature, appears to have focused the student's attention on developing ways to address the mental challenges of performing well in the business school which, in term, increased **satisfaction.**

Cognitive Perspective: Self-determination theory and intrinsic motivation

- Does reward increase people's intrinsic motivation or does it simply make them more likely to perform the behaviour when they can expect an external reward?
- According to **self-determination theory,** we have 3 innate needs (**competence, autonomy, relatedness to others**) and intrinsic motivation flourishes when these are fulfilled.
- Hence, if a reward is seen as compromising one's self determination, then intrinsic motivation will decline, but if seen as an indicator of competence then intrinsic motivation is likely to increase. This suggests that rewards should emphasise an individual's **competence rather than compliance.**

Humanistic Perspective

- Emphasis dignity, individual choice and self-worth as key in explaining human behaviour.
- Maslow believed that individuals are motivated by a desire for personal growth and fulfilment. He develop a hierarchy of needs.
- The **Hierarchy of Human Needs** is the cornerstone of his understanding of motivation, with 5 clusters being organised.
- All the needs **below self-actualisation** are called **deficiency needs.** The needs arrange themselves in order, with needs lower on the pyramid appearing sooner in development. Needs are then fulfilled sequentially. The needs are (in order from top of the pyramid)
    - Self-actualisation (last in order)
    - Esteem
    - Love
    - Safety
    - Physiological (First in order)
- Once **deficiency needs** are satisfied, **growth needs** surface (the person no longer feels hungry, insecure, isolated or inferior but instead needs to express oneself and grow, or to actualise one's potential).

- Critics argue the theory does not explain why higher needs often motivate people even when lower needs are unsatisfied.
- They also point out that people are simultaneously motivated by needs at different levels. E.g. Naomi might be motivated to join a theatre club because she wants to be part of a close community (**love**), but then might simultaneously want to be respected for her acting skills (**esteem**).
- Goebel and Brown's study in 1981 aimed to see whether there are developmental differences in motivations and whether these follow Maslow's hierarchy. Although Maslow did not propose age-related changes in motivation, his theory conveys the implication that studies would reveal individual progression through the sequence.
- The method in the study was investigated in 111 subjects between 9 to 80 years.
- Essentially, data revealed that there was limited support for Maslow's hierarchy as a developmental sequence, with data revealing that esteem needs seem to peak at adolescence and decrease at later stages of development, whereas love needs continue to rise into young adulthood. This suggests that **there is first a need to define one's self before integrating with others.** The second finding is that in contradiction to Maslow's Hierarchy, in later adulthood there is a slight decrease in need for self-actualisation. This suggests that there is a regression in needs satisfaction in older age, and that it is generally about the maintenance of needs at older age, rather than developing new ones.

Evolutionary Perspective

- Contends that motivational systems have been selected by nature for their ability to maximise reproductive success.
- For some motives this claim is unremarkable… organisms that don't replenish their enery by eating do not survive and reproduce (nature has therefore designed humans and other animals with systems for maintaining basic life-support processes).
- **Reproductive success** has expanded to include **inclusive fitness** (the influence of reproductive success on their genetically related individuals).
- There are some motivational mechanisms that have evolved to help organisms maximise their inclusive fitness. These mechanisms should guide behaviour so degree of investment is roughly proportional to degree of relatedness.
- Research has shown that some species are endowed with chemical mechanisms (**pheromones**) for kin recognition, which allows species to know their related species.
- Simmons' study in 1989 served to study where pheromones act as a kin identifier. The method used was to obtain larvae of known genetic relatedness and reared them from hatching in full sibling groups of 100 larvae.
- Research found that the recognition of kin is greatly enhanced if individuals are allowed to learn the characteristics of conspecifics (members of the same species) of different degrees of relatedness. To facilitate this learning, 3 pieces of soil paper were removed from each cage and 1 piece was placed into each of the other 3 cages containing larvae of different degrees of relatedness. This was repeated each week to allow a build up of odours from each cage on the paper. Thus, all individuals were exposed to the soiled paper from cages containing their half sibling, cousins and unrelated conspecifics.
- The sexes were then separated… females were left in their original cages while males were placed into clean cages with clean paper in which to shelter… kept in full sibling groups.
- The floor of an arena was covered with sand and one artificial shelter (which contained paper soiled by males of different degrees of relatedness), placed into each of the four corners.
- Females were then released into the centre of the arena and the time spent in each shelter was recorded.

- **Results:** Data support findings of a preference among females for associating with unrelated males. IN addition, females were able to recognise the odour of males which varied in their degree of relatedness, and interfering with their chemoreceptive capabilities removed their ability to discriminate.

Motivation to Drink and Eat

- A **motive** is an internal process that energises and directs behaviour… a **need** is defined as any condition within a person that is essential and necessary for life, growth and well-being.
- If neglected, a **need** will produce damage that disrupts biological or psychological well-being… motivation states provide the impetus to act before such damage occurs:
  - Damage can be to the body – motives arise from **physiological needs**
  - Damage can be to the self – motives arise from **psychological needs**
  - Damage can be to one's relationships – motives arise from **social needs**
- Biological functions (eating, drinking, sleeping etc.) are regulated by **homeostasis** → the body's tendency to maintain a constant state that permits cells to live and function.
- Although **homeostasis** regulates biological needs, it also **regulates many motives.**
- Cells in the body can only survive within a narrow range of conditions. Humans have evolved systems for regulating these conditions, which operate like a thermostat. That is, if the body is hot, the body operates itself to restore the temperature back to normal, known as a **correcting mechanism.**
- Thus, homeostatic systems include several features:
  - **Set point:** biologically optimal level the system strives to maintain
  - **Feedback mechanisms:** provide information regarding the state of the system with respect to variables being regulated.
  - **Corrective mechanisms:** restore the system to its set point when needed.
- Homeostasis is there for the body's ability to return a system to its **basal state** (to do so bodily systems generate motivational states). Thus, the body has both a tendency to maintain a steady state as well as the means to generate the motivation necessary to energise and direct homeostasis-restoring behaviours.

Physiological Needs

- Deficient biological conditions occur with tissue and bloodstream deficits, as from water loss, nutrient deprivation or physical injury.
- If water loss occurs below an optimal homeostatic level (around 2%), this creates the **physiological need that underlies thirst.**

Thirst

- A consciously experienced motivation drive that readies the body to perform behaviours needed to replenish water deficit.
- Drive is the conscious manifestation of an underlying biological need that has motivational properties.

How Does Thirst Arise?

- In our bodies, water lies inside (intracellular fluid contributes 40% of body weight) and outside (extracellular fluid contributes 20% of body weight) cells.
- Thirst can therefore arise from these 2 distinct sources:
  - **Osmometric (intracellular deficits):** in cases of cellular dehydration.
  - **Volumetric (extracellular deficits):** in cases of bleeding, vomiting etc.
- Rolls, Wood, & Rolls in 1980 examined the cause of thirst activation by assigning animals to 1 of 3 conditions:
  1. 24 hour deprivation and intracellular replenishment

2. 24 hour deprivation and extracellular replenishment
3. 24 hour deprivation and no replenishment (control group)

- The results found that animals that received extracellular fluid replenishment latr drank a little less than those with no replenishment.
- Also, animals that received intracellular fluid replenishment drank much less than both.
- Thus, this suggests that **Osmometric thirst is the primary cause of thirst activation (thirst that come mostly from dehydrated cells).**

How does our body know when to stop drinking?

- A **negative feedback system** is essentially homeostasis' physiological stop mechanism.
- Blass and Hall's 1976 study found that animals fed water that was arranged to pass through the mouth but not reach the stomach will drink 4 times the normal amount of water before stopping. Thus, **water passing the mouth provides a WEAK means of thirst inhibition, but it did eventually stop (There was some negative feedback mechanism).**
- Hall's 1973 study found that when water is passed from the mouth to the stomach, but not the intestines, bloodstream or cells, animals drink twice as much as normal. Thus, the **stomach has a weak thirst inhibitory mechanism.**
- Finally, Mook and Kozub's 1968 study examined what happened when water passed through the mouth, stomach, intestines and extracellular fluid, but when the water solution also is a salt solution which meant that:
  1. Much water passes into extracellular fluid
  2. Little water passes into intracellular fluid

  In this case, it was found that the animals drank more than normal. Thus, **the cells themselves also house a negative feedback mechanism.**
- Through the **hypothalamus,** the brain monitors intracellular shrinkage (caused by low water levels) and releases a hormone into blood plasma that sends a message to the **liver** to conserve water (kidneys will also release water if low on fluid).
- The brain also creates a conscious psychological state of thirst to direct attention to action that are aimed at replenishing water.
- There are several environmental influences affectining drinking, particularly preferences of taste. Pfaffmann's 1960 study sought to discover whether drinking behaviours would change when water is given a taste. Using tasteless water as a baseline, any taste is slightly pleasant at a very low intensity. At greater intensities, sweet water is more pleasant than is tasteless water, but sour, salty and bitter water were more unpleasant. This suggests that sweet water is overdrunk, tasteless water is drunk regularly and sour water is under consumed.

Hunger

- The function of eating is **metabolism –** a process by which the body transform food into energy.
- Hunger regulation involves **short-term daily processes** operating under homeostatic regulation and **long-term processes** operating under metabolic regulation and stored energy.
- In regard to **short-term appetite:**
  - Cells require glucose to produce energy… after a cell uses its glucose to carry out its functions, a physiological need for glucose arises (these levels are monitored by the liver)
  - The **glucostatic hypothesis** argues that blood sugar levels are critical to hunger – when blood glucose drops, people feel hunger and want to eat.
  - Campfield, Brandon and Smith's 1985 study hypothesised that a pre-meal decline in blood glucose is or reflects a signal for meal initiation in rats. The method they used was to continuously measure blood glucose and food intake in free-feeding rats.

- They found that blood glucose declines 12 minutes prior to meal onset. Also, they found that when glucose was infused to partially block the pre-meal decline, subsequent meal was delayed suggesting pre-meal decline in blood glucose is causally related to meal onset.
- Similarly in humans, sensations of hunger increase as glucose levels decrease… an injection of a drug that suppresses blood glucose levels results in feelings of hunger even after a meal.
- According to the **glucostatic hypothesis,** appetite rises and falls in response to chances in blood glucose that stimulate:
    1. Lateral Hypothalamus to increase hunger
    2. Ventromedial Hypothalamus to decrease hunger
- Hence, the **lateral hypothalamus** is the brain centre responsible for generating the psychological experience of hunger… when stimulated, the **ventromedial hypothalamus** acts as the brain's satiety centre → effective the negative feedback system.
- Anand and Brobeck's 1951 study examined whether variations in food intake have been described following injury to certain parts of the hypothalamus, using 94 female albino rats where electrolytic lesions were placed in different areas of the hypothalamus. They found that bilateral destruction (both sides) of small area in extreme lateral part of **lateral hypothalamus** led to complete cessation of eating… gradual reduction of body weight. Alternatively, bilateral lesions involving the **ventromedial nuclei** produce hyperphagia and obesity.

- In regard to **Long-Term Energy Balance:**
    - **Lipostatic hypothesis:** when the mass of fat stored drops below or increases above its homeostatic balance, adipose tissue secretes hormones into the bloodstream to either promote weight gain motivation that increases food intake or reduce food intake and promote weight loss motivation.
    - A spin off of this hypothesis is the **set-point theory,** which argues that each individual has a biologically determined body weight set by genetics. In this theory, hunger activation and satiety depend on the size of one's fat cells which vary over time… huner is the body's means of defending its genetic set point.
- Eating behaviour is influenced further by cognitive, environmental, social and cultural factors. For example, much of our eating is regulated by learning and habit… while stress, and the sigh, smell appearance and taste of food influence eating behaviour.
- In addition, availability of food variety and large portion sizes encourage over eating.
- Research in the form of Berry, Beattty and Klesges's 1985 study has proven that people eat more in the presence of others. However, greater variety of flavours did not amount to males eating more when in the presence of others.
- **Sensory specific satiety** is greater when the foods differ simultaneously in several sensory properties, but can be demonstrated even if foods differ ONLY in colour, shape and taste. Essentially, build up of sensory specific satiety limits intake of a single food, but when eating a variety of foods, less satiety builds up to any one of those.
- Consequently, if males were less susceptible to the effects of sensory specific satiety, then this might explain their reduced response to the stimulating effect of variety on consumption.

Psychosocial Motives

- These are less obviously biological, but are strongly influenced by evolved tendencies rooted in our biology. 2 major clusters of goals that people pursue:
    1. **Relatedness –** motives for connectedness with others
    2. **Agency –** motives for achievement, power, autonomy, mastery

Relatedness

Needs for relatedness:

- **Attachment motivation:** the desire for physical and psychological proximity to another person.
- **Intimacy:** special kind of closeness characterised by warmth, self-disclosure and mutual caring.
- **Affiliation:** Interaction with others.

- Murata et al in 2005 examined whether a lack of supportive relationships is a risk factor for mortality, involving almost 2000 participants aged 65 and over. Results found that social relationships and mortality were associated among the *old-old individuals* (75+). This suggests that with advancing age, the importance of social relationships increases.
- They also found that for men, having a job and being part of a group were significantly associated with lower mortality. In addition, for women, having a job and living alone were significantly associated with lower mortality.

Agency/Achievement

1. **Achievement goals** reflect a blend of several motives.
2. **Performance goals** are motives to achieve at a particular level. Emphasis is on the outcome (success/failure). Some people may be motivated to attain a goal, known as **performance-approach goals.** Other people may be motivated by a fear of not attaining it, known as **performance-avoidance goals.**
3. **Mastery goals** are motives to increase competence, mastery or skill.

- The 3 types of goals underlying achievement predict different outcomes:
  1. Students with high **performance-approach goals** tend to get good grades but may or may not develop intrinsic interest in study material.
  2. Students with high **performance-avoidance goals** tend to get both low grades and gain less intrinsic pleasure in learning.
  3. Students with **mastery goals** often get good grades AND develop intrinsic interest in study material.

Brain Mechanisms Underlying Motivation

- Dopamine was first identified with motivational function after finding that feeding and drinking deficits can be induced by damage to dopamine fibres.
- Events that signal rewards and pleasure trigger neurons in the **dopamine pathway** to release dopamine… this then triggers an emotional positivity. E.g. Smelling freshly baked cookies → dopamine release will occur. This suggests that it is not the eating that causes dopamine release, but the **anticipation** of a rewarding meal.
- Because dopamine release occurs with **anticipation** of reward, it thus participates in **preparatory phases of motivated behaviour.**
- Dopamine release not only signals the prospect of forthcoming reward, but also teaches us which events in the environment are rewarding. For example, if an environmental event is to acquire and maintain incentive motivational properties, then dopamine release needs to occur.
- Dopamine release is also **greatest when rewarding events are unpredicted or underpredicted.**
- Mirenowicz and Shchultz in 1994 found that dopamine neurons respond to free, unpredicted liquid delivered outside behavioural tasks. The same neurons responded to liquid reward during learning, but not when task performance was established → **neuronal response occurred to the reward predicting stimulus.**

- Clearly, the findings indicate that neuronal responsiveness was determined by the particular condition in which liquid was delivered, namely its unpredictability… responses were invariably lost after learning when rewards were predicted by the sound.
- Evidence that stimulation of the **dopamine pathway** creates an experience of reward comes from studies of intracranial self-stimulation and drug self-administration. **Olds and Milner discovered rats return to an environment where they had received electrical brain stimulation.**
- Although it is true that activation of other brain systems can produce rewarding effects, activation of the **medial forebrain bundle** as it courses through the lateral hypothalamus to the ventral tegmentum produces the most robust rewarding effects.

In conclusion, dopamine release is associated with 2 events:

1. **Generates positive feelings**
2. **Activates voluntary goal-directed approach responses**

The dopamine pathway included an interface with the body's muscular/motor system via the **nucleus accumbens.**

Stimulation of the dopamine pathway increases the likelihood of approach behaviour partly because good feelings create approach motivation and activation of the motor system released goal-directed approach behaviour.

Overall, as events come and go, the brain detects some of these events as being biologically significant and releases dopamine that generates good feelings and goal-directed approach behaviour. Further, the pleasurable experience of dopamine allows the person to learn which environmental events are to be associated with pleasure and approach. **Dopamine is therefore a neural mechanism by which motivation gets translated into action.**

Learning

- The **broken escalator phenomenon** is a strange sensation of losing balance when stepping on to a moving stairway that is not working. Your body has learnt to expect the forward propulsion. This is a **learnt behaviour,** with part of the brain sending signals to the legs and the body **expecting** movement based on **previous experiences.**
- 4 types of learning:
  1. **Noticing and Ignoring –** Need to notice important events but learn to ignore events that occur repeatedly without consequence. This is known as **sensitisation** and **habituation.**
  2. **Learning What Events Signal –** Need to learn when something is about to happen so that we can prepare for it. This is known as **classical conditioning.**
  3. **Learning about the Consequences of our Behaviour –** Need to learn the results of our behaviours to avoid making mistakes and repeat behaviour that produce positive outcomes; learn when and how to act. This is known as **operant conditioning.**
  4. **Learning from Others –** Need to learn from the results of the behaviours of others. This is known as **observational learning.**

Defining Learning

- Learning is a 'relatively permanent change in behavioural potentiality that occurs as a result of reinforced practice.' (Kimble, 1961).
- That is, learning is any enduring change in the way an organism responds, based on experiences.
- Learning cannot be observed directly. It is *inferred* from behaviour that is observed.
- **Conditioning** is a process of *learning associations* between environmental stimuli and behavioural responses.
- What is NOT learning: **instincts and reflexes are NOT learning.**
- Learning can either be **associative** or **non-associative.**
- **Associative learning:** result of learning to associate one stimulus with another. E.g. Thunderstorms could be associated with panic of dogs.
- **Non-Associative learning:** Learning what results from the impact of **one** particular stimulus. E.g. **Habituation –** response wanes with repeated exposure → we learn to ignore repeated stimuli.
- It can take several trials or recurrences for habituation to occur. Habituation occurs when organisms notice changes in the environment but learn to ignore those that occur repeatedly.
- Habituation is the *simplest form of learning.*
- A rat's greatest fear is the odour of cats. A study concerning rats found that rats repeatedly exposed to a cat's odour, with no cat, hid less over time.
- Sometimes, instead of **habituation,** repeated occurrences cause **sensitisation –** occurs when our response to an event **increases** rather than decreases with repeated exposure. E.g. Baby crying.
- To determine whether you will get **habituation or sensitisation,** it is usually said that **mild instances lead to habituation,** while more **intense, potentially threatening stimuli lead to sensitisation.** E.g. An elderly car causes engine noises, and upon being fixed, another sound occurs a week later. This is probably **sensitisation** as you are thinking more so about it, sounds that might formerly have been ignored.

How does learning occur? ASSOCIATION

- Habituation and sensitisation are **Non-associative learning.**

- We also learn by **Association.** Our minds naturally connect events that occur in sequence (Aristotle, Locke, Hume).
- **Classical conditioning** is about preparing the organism for the event that is about to occur. E.g. If you anticipate drinking a soft drink, the body will create saliva.
- **Classical conditioning** is also known as **Pavlovian Conditioning.** It involves the learning of a new association between 2 previously unrelated stimuli. We learn that a stimulus **predicts** the occurrence of a certain event and we respond accordingly.
- In classical conditioning, all responses are *reflexes or autonomic responses,* meaning that they are responses we **cannot voluntarily emit.**
- Pavlov's experiment brought about the rise of key terms such as **neutral stimulus** and **unconditioned stimulus.** He found that by ringing a bell, you can condition a dog to expect something (in this case food).
- **Neutral Stimulus (NR):** the stimulus that, before conditioning, doesn't naturally bring about the response of interest. E.g. in Pavlov's experiment, the neutral stimulus was a sound from the bell.
- **Unconditioned Stimulus (US):** A stimulus (event) that triggers an unconditioned (involuntary) response – without previous conditioning. E.g. In Pavlov's experiment, the unconditioned stimulus was the food.
- **Unconditioned Response (UR):** An unrelated response to an unconditioned stimulus occurring without prior conditioning. E.g. in Pavlov's experiment, salivation to food to the unconditioned stimulus.
- **Conditioned Stimulus (CS):** Was previously the neutral stimulus, but through repeated pairings with the Unconditioned stimulus, now causes a **Conditioned Response.** E.g. in Pavlov's experiment, the CS was the sound from the bell.
- **Conditioned Response (CR):** Learned reaction to a Conditioned stimulus occurring because of previous repeated pairings with a CS. E.g. in Pavlov's experiment, the salivation for food when hearing the sound of the bell (the conditioned stimulus).
- In a practical scenario, the aforementioned use of classical conditioning is applied in **classical cases of advertising:**
  - For example, advertisers often used an attractive women in conjunction with their product (e.g. an almost naked attractive woman holding a coca-cola) to condition observers into educing a positive emotional response of their product through affiliation with the unconditioned response of positivity associated with the attractive women.
  - That is, the unconditioned stimulus (attractive women) provoked an unconditioned response of positivity. By associating that women with coca-cola, coca cola becomes the **conditioned stimulus,** with an attempt to evoke a **conditional response of positivity** in regard to the stimulus of coca-cola.
- Does advertising work, however? An experiment by Stuart et al. (1987) examined whether pairing products with stimuli that elicited positive emotions worked. They showed a series of slides to uni students that contained neutral scenes, pleasant scenes, and various products. In the experimental group, Brand L toothpaste was presented several times and always followed by pleasant scenes. The study found that the experimental students rated Brand L significantly more positively than the control group (who only were shown neutral scenes after the Brand L toothpaste) did.
- We also learn about stimuli that have unpleasant consequences. An example of this is **taste aversion learning.** For example, you might try a drink, which causes you to vomit. At next encounter with that drink, you will choose something else knowing the unpleasant consequences.
- In addition, not only will the memory of the consequences cause you not to drink it, but the **taste aversion learning mechanism** causes you not to like the drink next time if you had a bad experience with it.

- Ilene Bernstein in 1978 questioned whether the loss of appetite in patients undergoing chemotherapy was due to the acquisition of taste aversions. Children undergoing chemo received a novel ice cream just before they received the chemo drug that made them nauseous. On their next visit, they were offered a choice of eating the same ice cream again or playing a game, and the majority of children **chose the game,** as they had acquired an aversion to that flavour of ice cream. Meanwhile, the control group who did not undergo chemotherapy chose the ice cream over the toy.
- Hypothetically, if the ice cream was replaced with the toy, we can hypothesise that the kids would not develop an aversion to the toy in accordance with the paper by Garcia and Koelling (1966). This study demonstrated that **some association are more easily learned than others.**
- The aforementioned concepts refers to the **acquisition phase of classical conditioning.**
- The next potential phase of classical condition is **extinction,** which occurs when a learned response is eliminated by the removed of the unconditioned stimulus. However, **spontaneous recovery** of the response may arise, with the re-emergence of an extinguished conditioned response after a rest period.
- Once something is learnt, it is there forever.

Extinction and Spontaneous Recovery

- What would happen if Pavlov presented the bell without the food? This would result in **Extinction:** the conditioned response would weaken when the conditioned stimulus (bell) is presented without the unconditioned stimulus (food).
- Extinction is *not the unlearning* of the conditioned response. It is a learned ***inhibition*** of responding.
- But after a period of time, in the absence of any more presentations of either the CS or the US, there may be **spontaneous recovery:** the re-emergence of a previously extinguished conditioned response.

Acquisition of Phobias

- Watson and Rayner's 1920 study concerned how phobias were acquired. They used a baby boy to do so. They showed the baby a rat, who had an orienting response (wasn't afraid). He sought to condition the child to fear the rat. Two months down the track, each time the baby reached for the rat (**CS**), Watson made a loud clanging noise (**US**) right behind Albert. Albert's fear generalised to anything white and furry. The **UR** was that the child started violently, with lips begin to tremor and tremble, while also crying.
- This experiment extended to a theory called **stimulus generalisation,** which meant that the baby came to feat other things that were white and furry. E.g. Cotton Wool, Santa Claus.

Stimulus Generalisation

- 'He who hath been bitten by a snake fears a rope' – Old English Proverb.
- **Stimulus Generalisation:** A tendency to respond to stimuli that are similar, but not identical, to an unconditioned stimulus.
- However, **stimulus discrimination** is the learned ability to distinguish between a conditioned stimulus and other stimuli that do not signal an unconditioned stimulus.

Conditioned Allergic Reactions

- It is possible to condition allergic reactions.
- Pair a neutral stimulus (**CS = sight of flowers**) with an allergic reaction **(US** = **pollen which produces a UR = allergic response).** The person will then begin releasing histamines (**CR = allergic response)** at the ***sight*** of the flower (i.e. not just the pollen.
- This may even extend to an artificial flower.

- A study concerning condition was observed in Bovbjerg et al.'s 1990 experiment. Classical conditioning suggests that stimuli associated with chemotherapy should suppress the immune system. 20 female ovarian cancer patients were observed, with the patients returning home within 24-48 hours of treatment. The **US (Chemo)** caused the **UR (nausea/vomiting and immunosuppression).** The **NS (hospital)** caused no reaction. The **NS (hospital) + the US (chemo)** caused **UR (nausea/vomiting),** which was repeated several times. It was found that the **NS** became a **CS (hospital)** which caused a **CR (nausea/vomiting and immunosuppression).** In essence, the study found that women received chemotherapy experienced both increased nausea and decreased immune function when returning to the hospital setting.

Second or Higher-Order Conditioning

- In essence, it is possible to get the **CS** to single-handedly (without requiring the assistance of the **US**) get the respondent to evoke a **CR.** For example, it is possible in the Pavlov scenario for the bell (**CS**) to cause salivation (**CR**) without pairing with the food (**US**).
- Later on, it is possible do the same process to cause a light to cause a dog to salivate. That is, the light has never been paired with food, but it has acquired its associative strength from the bell (**CS**) which was able to also **act like a US** in order to support conditioning.
- There are 2 factors which determing the extent of higher-order conditioning:
  1. The **similarity** between the higher-order stimulus and the original conditioned stimulus.
  2. The **frequency** and **consistency** with which the 2 conditioned stimuli are paired.

The Cognitive Elements of Classical Conditioning

- Classical conditioning only occurs when an animal has learned to set up an ***expectation.***
- Conditioning is easier when the **CS** is an unfamiliar event than a familiar one (no pre-existing expectations). E.g. The bell had no prior use or expectation for the dog.

How does the Conditioned Response Form?

- **Contiguity Theory –** when two stimuli are presented together in time, associations are formed between the two.
- Contiguity theory explains most of the data, evidenced by imposing a delay between **CS** and **US** but it does not explain everything.
- In the 1960's, in addition to the **Contiguity Theory,** there was a theory proposed by Robert Rescorla called the **Contingency Theory.** Rescorla agreed with Pavlov that for learning to take place, the **CS** had to be a useful predictor for the **US.**
- But he disagreed on what made the **CS** a useful predictor. He maintained that it was the **contingency** between the **CS** and the **US.**
- Rescorla challenged the simple mechanistic views of learning, as he conceptualised classical conditioning as involving the *acquisition of information* about the relationship among events in the environments. 2 different association patterns produce 2 different outcomes.
- For example, in a case involving 2 groups of rats who were shocked 40% of the times (both groups) when a bell was rung, only the second group conditioned a fear of the bell as group 2 had a lower shock percentage received (20% of the time) when no bell was used (in contrast to 40% shock instances when no bell was received in group 1). This emphasised the significance of **2 different association patterns producing 2 different outcomes.**
- However, these associations are an **imperfect predictor,** much like the weather.

What affects the Acquisition of the Conditioned Response?

- IN addition to contiguity and contingency:
  - **Sequence of the CS-US presentation**: the time when the CS and US are presented. Four types of sequences:

1. Delayed conditioning – CS comes on first and overlaps with the US coming on → **Most easily established conditioning.**
2. Trace conditioning – A gap between the CS and US → **Ease of conditioning depends on length of the trace (gap).**
3. Simultaneous conditioning – CS and US come on at the same time and go off at the same time → **Very little conditioning established.**
4. Backward conditioning – US comes before the CS → **No conditioning I.E. CS can't predict US.** However, this can cause **inhibitory conditioning** where the 'learner' recognises that the CS means the US is over and won't be coming again.

- **Strength of the US:** the larger the US value, the greater the conditioning. Some US' are extremely effective and produce rapid conditioning.
- **Number of CS-US pairings:** The more often the 2 stimuli are paired, the greater the conditioning to a point. At some point a response ceiling is reached, known as **asymptote.**
- **Reliability and uniqueness of CS as a predictor of US i.e. Contingency**
- **'Belongingness' of CS with the US.**

Instrumental Learning or Operant Conditioning

- This refers to **learning that occurs from possible consequences of our actions.**
- E.L. Thorndike proposed the **Law of Effect,** which asserts that this is caused by consequences or 'effects.' Behaviours that had a **satisfying** effect were **'stamped in,'** while behaviours that had an **annoying** effect were **'stamped out.'**
- B.F. Skinner also asserted that consequences of behaviour determine the probability that the behaviour will occur again.

Operant Conditioning

- This is the learning of a new association between behaviour and its consequences.
- It is learning through **reinforcement** (reward) and **punishment.**
- Behaviour is **voluntary,** contrary to the concept of classical conditioning where a response which is **involuntary (reflexes).**
- Operant conditioning is different from classical conditioning is given in the following example. If a rat is operantly conditioned, the rat's behaviour causes food to appear. If a rat is classically conditioned, food is delivered irrelevant of the cat's behaviour.

Thorndike

- Thorndike studies cats placed in puzzle boxes.
- He proposed the **Law of Effect,** which asserted that:
  - Behaviour that results in *reward* will be more likely in the future.
  - Behaviour that results in *punishment* will be less likely in the future.
  - Behaviour is controlled by its consequences.

Skinner

- Skinned coined the term 'operant conditioning.'
- He drove the movement towards **'radical behaviourism':**
  - The factor controlling an organisms' behaviour was the consequence of that behaviour
  - The only appropriate object of study is observable behaviour
  - The laws governing 'learning' via operant conditioning *were the same for all organisms*.

Reinforcement Contingencies

- Contingencies reflect conditions that must be met in order for reinforcement to be dispensed.
- Reinforcement must be meaningful to the organism.

Consequences of Responding in Operant Conditioning

- The term **consequence** is used where there is a contingent between a behaviour and an event.
- Therefore, there are **two types of contingent relationships between a response and a consequence:**
  1. **Positive Contingency –** When a response causes the *presentation* of a stimulus.
  2. **Negative Contingency –** When a response causes the *removal* of a stimulus already present.
- Different types of stimulus event can be pleasant, unpleasant or neutral.
- Pleasant can be called **appetitive,** while unpleasant can be called **aversive.**
- The word negative in negative contingencies does not mean nasty, but rather it means the **removal of something.**

Two Types of Effects on Behaviour

- As stated above, there are 2 types of relationships between a response and a consequence (positive and negative).
- When there is a **positive contingency –** causes the response to increase in frequency.
- When there is a **negative contingency –** causes the response to decrease in frequency.

There are 4 types of behaviour-consequence relationships in operant condition:

1. **Appetitive (nice) stimulus** and **Positive Contingency (Stimulus Added)** → **positive reinforcement** (behaviour increases in frequency)

For example, the ***presentation*** of a **pleasant** stimulus after a behaviour makes the behaviour **more likely** to occur in the future. E.g. A chocolate which brings joy.

2. **Aversive (nasty) stimulus** and **Positive Contingency (Stimulus Added)** → **positive punishment** (behaviour decreases in frequency)

For example, the ***presentation*** of an **aversive** stimulus after a behaviour **reduces the likelihood** of the behaviour occurring in the future. E.g. Smacking a child.

3. **Appetitive (nice) stimulus** and **Negative Contingency (Stimulus Removed)** → **negative punishment** (behaviour decreases in frequency)

For example, the ***removal*** of a **pleasant** stimulus after a behaviour **reduces the likelihood** of the behaviour occurring in the future. E.g. Losing your license because of speeding.

4. **Aversive (nasty) stimulus** and **Negative Contingency (Stimulus Removed)** → **negative reinforcement** (behaviour increases in frequency).

For example, the ***removal*** of an **aversive** stimulus after a behaviour makes the behaviour **more likely** to occur in the future. E.g. Giving Panadol when a headache is present, which results in relief from the headache (the stimulus removed).

SUMMARY → In essence, when understanding the above 4 concepts, it is critical to understand that:

- The word negative in the relationships means the removal of stimulus while the word positive means the addition of stimulus.
- The word reinforcement means that the behaviour increases in frequency while the word punishment means that the behaviour decreases in frequency.
- For example, in **positive punishment** → **Positive** means to add on, and **punishment** means to decrease the frequency.

Acquiring Complex Behaviours: Shaping

- Complex behaviours are unlikely to occur spontaneously, so they are had to reinforce. As such, a solution to this is **shaping –** a procedure in which reinforcement is delivered for successive approximations of the desired response. That is, demanding behaviours closer to the desired one before a reward is given. E.g. Training a dog to fetch the paper.
- Skinner *shaped* a dog to jump up a wall for a magazine.

Response Chaining

- Is used to teach complex behaviours.

- Is usually done by teaching the subject by teaching them the end response first. That is, the final behaviour in the chain of behaviours is taught first, before then proceeding to teach the subject in reverse of the normal chain of events.

Variables Affecting Operant Conditioning

Reinforcer Magnitude

- The **larger** the reward, the **faster** the acquisition of learning.
- The **quality** of the reinforcer is also important.
- The reward has to be of a certain value for the response to be performed (After acquisition).
- Crespi found that the larger the reward, the faster rats run down an alley. He also found that the likelihood and intensity of a response depends on size of reward, meaning that it must be sufficient for a response to occur.
- Reward size also affects **human** learning:
  - Children aged 4 and 5 learn faster hen given small prizes instead of tokens.
  - Adults show higher achievement when paid more money.
  - Rats prefer 1 cube in pieces to one cube as it *appears to be greater.*

Delay of Reward

- The **greater** the delay, the **weaker** the learning.

Primary and Secondary Reinforcers

- **Primary:** Reinforcers such as food, water and sex that have an innate basis because of their biological value to the organism.
- **Secondary:** Stimuli, such as money or grades, that acquire their reinforcing power by a learned association with a primary reinforcer. These are also called **conditioned reinforcers.**
- The basic procedure for establishing a secondary reinforcer is the process of classical condition.
- Other reinforcers can be in the form of an activity. The **Premack Principle (Grandma's Rule)** asserts that using a desired high frequency behaviour can reinforce a less desirable or lower frequency behaviour. For example, parents use it when they tell their kids to eat their veggies (less desirable) if they want to get ice-cream (more desirable).

Issues with Punishment

1. Does not usually result in long term behavioural chance – **effects are temporary.**
2. Does **not promote better, alternative behaviour.** A better way is to reinforce an alternative response.
3. Leads to **escape behaviour** → E.g. When an RBT is set up, going through backstreets.
4. Learner may learn to **fear the administrator** rather than the association between their behaviour and the punishment.
5. Punishment may not undo existing rewards for a behaviour – unless it is **delivered every time.** In essence, punishment has to be delivered every time for it to be effective.
6. Punitive aggression may lead to **modelling of aggression.**

Stimulus Control over Responding

- Stimulus Control can be defined as the degree to which the desired response occurs in the presence of a specific stimulus and does not occur in the absence of this stimulus.
- For example, we can view traffic lights as **discriminative stimuli over our voluntary emitted behaviour** (as opposed to reflexive responding in classical conditioning).
- As such, in operant terminology, we could say that to make an accelerating response to the green stimulus (green traffic light), and a braking response to the red stimulus (red light).

Consequences

- **Continuous Reinforcement:** reinforcing the desired response each time it occurs. This is excellent for learning new behaviours. Some problems with continuous reinforcement include:
  - **Habituation to the reinforcer:** The reinforcement loses its reinforcing qualities.
  - **Satiation:** The organism becomes sated (full or satisfied) with the reinforcer.
- **Intermittent Reinforcement:** Periodic administration of the reinforcement. This reinforcement maintains behaviours with fewer reinforcement trials following initial learning. Some consequences include:
  - Slower acquisition
  - Greater resistance to extinction
- **Fixed Ratio:** Reinforces a response only after a specified number of responses. The faster you respond the more rewards you get. Consequences of this and **ratio schedules** include:
  - Needing a very high rate of responding to ensure effectiveness
  - Faster response gets more reward
- **Variable Ratio:** Reinforces a response after an unpredictable number of responses. An example would be playing poker machines. The consequence of this is that processes are hard to extinguish because of unpredictability.
- **Fixed Interval:** Reinforces a response only after a specified time has elapsed. The response occurs more frequently as the anticipated time for reward draws near. AN example would be receiving a pay cheque every 2 weeks.
- **Variable Interval:** Reinforces a response at unpredictable time intervals. Produces slow steady responding. E.g. Waiting to get through to a busy or engaged phone number.

Applications of Operant Conditioning

- **Behavioural Therapy:**
  - Reducing nail biting
  - Controlling weight
  - Quitting smoking / alcohol
- **Behaviour Modification:**
  - Remedial education
  - Cognitive Behaviour Therapy (**CBT**)

Is Reward Necessary for Learning?

- Tolman and Honzik constructed a maze to demonstrate **latent learning** by rats. There were 3 groups of rats:
  1. Group 1: Never fed in maze
  2. Group 2: Food reinforcer delivered in goal box on every trial
  3. Group 3: Conditions switched on day 11 (1st 10 no food, next 7 food was available)

Latent Learning

- Tolman and Honzik's experiment results found that there was a rapid improvement in performance that occurred when food was made available to the previously unreinforced animals.
- This indicates that learning had occurred, but that it remained hidden or unexpressed.
- **Latent Learning** was coined as learning was taking place, but it was **not observable**. It only becomes apparent when you give them a motivation to respond.

Learned Helplessness

- Overmier and Seligman (1967) found that dogs exposed to **inescapable** and **unavoidable** electric shocks in one situation **later failed to learn to escape shock in a different situation**

where escape was possible. Shortly after, Seligman and Maier (1967) demonstrated that this effect was caused by the **uncontrollability** of the original shocks.

- Seligman tested 2 groups of dogs:
  1. Group A: A group of dogs who could control whether they could stop shocks by a wooden panel
  2. Group B: Had no control over the shocks
- Seligman then placed both groups of dogs in a shuttle box. After a while the lights go out, and later the box is made dark. After 10 seconds in the dark, the floor of the box delivers a shock to see if the dogs learn to jump the barrier to the safe other side.
- Group A (who had **escapable and controllable shock**) all learned to jump the barrier. Meanwhile, Group B (who had **inescapable and uncontrollable shock**) 2/3 dogs **failed to learn to escape** let alone avoid the shock. Hence, only 1/3 of these dogs in Group B learned to escape.
- However, Seligman found that this is not permanent. He dragged the dogs who did not escape over the barrier, until they started moving at their own accord, and avoided the shock. This showed that **learned helplessness <u>is not permanent.</u>**

Observational Learning (Social Learning)

- Also known as vicarious learning, imitation, modelling etc.
- Essentially, it's about learning from others. Also known as **behavioural contagion.**
- It is learning that occurs as a result of observing the experiences of others.
- Many species including chimpanzees, rhesus monkeys and some birds learn by **observation.**
- We start to imitate from 12 days of age onwards.
- Behaviours that are learnt are specific actions and general styles of behaviour.
- We copy when **asocial learning is costly.** Cant afford to learn from your own mistakes as in operant conditioning. E.g. Might get lost if we don't take same precautions as experienced bushwalkers.
- We also copy successful individuals.

Social Learning

- Results from one of a number of other social phenomena besides true imitation:
  - **Social Facilitation –** One's behaviour prompts similar behaviour of another.
  - **Local or Stimulus Enhancement –** Behaviour of one person directs attention of others to an object. This occurs after observing another individual engage in that activity, but the observer *does not necessarily attend to the actions of the 'model.'* E.g. If someone stares at the sky, others will look up to see what you're looking at.
  - **True Imitation –** Imitation of a novel behaviour pattern in order to achieve a specific goal of particular interest that is either very unusual or quite improbable to have occurred by other means.

Albert Bandura

- Proposes we learn through **Imitation** or **Modelling** → Observational (or vicarious) learning.
- This explains the SPEED of learning in young children.

Social Learning Theory

- Children can learn by observation.
- Child can learn without immediate performance of the behaviour.
- The child has to see someone do it.
- Bandura noted that the 'model' had to have certain key features:
  - **Appropriateness –** Aggressive male models are more likely to be imitate than aggressive female ones, due to cultural factors in the Western world.

    - **Similarity –** Children are more likely to imitate someone they perceive as similar to themselves.
- Bandura and Ross' 1961 study aimed to see if children who were witnesses to an aggressive display by an adult would imitate this aggression if given the opportunity. 2 adult models were used, a male and female.
- The method used was a laboratory experiment in controlled conditions, with 24 children used in each different condition. The conditions were:
    - Non aggressive condition
    - Aggressive condition
    - Control condition
- There were 12 male and female children in each condition.
- Results found that exposure of children to an aggressive model **increases probability** of aggressive behaviour. Boys reproduced MORE imitative physical aggression than girls (but NOT more imitative verbal aggression).
- Non-aggressive male models had **more effect** than non-aggressive female model.
- Bandura and Ross hence concluded that:
    1. Exposure to aggressive models will lead to imitation of the aggression observed.
    2. Exposure to non-aggressive models generally has an inhibiting effect on aggressive behaviour.
    3. Same-sex imitation is greater than opposite-sex imitation for some behaviours (boys especially).
    4. Boys imitate aggression more than girls and are generally more aggressive except for verbal aggression.

In essence, **Aggression is a learned behaviour.** Learning can take place in absence of reinforcement, in the form of observation and modelling.

Bandura, Ross and Ross (1963) had further research that found when watching **filmed models rather than live models,** the children learned **even more aggression.**

Bandura's research is the 'first generation' of scientific research on the effects of media violence on children.