

## **6.1: Classical Conditioning- Learning By Association**

Learning: A process by which behaviour or knowledge changes as a result of experience

Pavlov's Dog: Classical Conditioning Of Salivation

- Classical Conditioning: Learning that occurs when a neutral stimulus generates a response that was originally caused by another stimulus (associate events)
- Stimulus: External event or cue that elicits a response
  - Unconditioned Stimulus (US): Elicits a response without learning (food)
  - Unconditioned Response (UR): Reflexive, unlearned, reaction, to an unconditioned stimulus (Salivation)
  - Conditioned Stimulus (CS): A once neutral stimulus that later elicits a conditioned response because it was once paired with a US (Metronome)
  - Coordinated Response (CR): The learned response that occurs to the conditioned stimulus (salivation)

Process Of Classical Conditioning

- Acquisition: The initial phase of learning in which a response is established
  - Dogs response has formed
- Extinction: The loss or weakening of a conditioned response when a conditioned stimulus and unconditioned stimulus no longer occur together
  - Slowly than stops salivating to bell
- Spontaneous Recovery: The reoccurrence of a previously extinguished conditioned response, typically after some time has passed since extinction
  - Dog responds again
- Generalization: The response that originally occurs to a specific stimulus also occurs to a different one through similar stimuli
  - Responds to similar tones on the metronome
- Discrimination: Occurs when an organism learns to respond to one original stimulus but not to new stimuli that may be similar
  - Does not respond to similar metronome tones

Conditioned Emotional Responses

- Conditioned Emotional Response: Emotional and physiological responses that develop to a specific object or situation
- Preparedness: Biological predisposition to rapidly learn a response to a particular class of stimuli, a response to fear
  - Nonthreatening → flower → shock → Low conditioned fear
  - Acquired Threat → Gun → Shock → Moderate conditioned Fear
  - Biological Threat → Snake → Shock → High conditioned Fear
- Conditioned Taste Aversion: Acquired dislike or disgust of a food or drink because it was paired with illness
- Learning without awareness
  - Drug use + Tolerance
  - Sexual Arousal
  - Diet beverages

## 6.2: Operant Conditioning- Learning Through Consequences

Operant Conditioning: A type of learning in which behaviour is influenced by consequences

Process of Operant Conditioning

- Contingency: Consequence depends upon an action
- Reinforcement: A process in which an event or reward that follows a response increases the likelihood of that response occurring again
  - Thorndike's: "Law Of Effect": The idea that responses followed by satisfaction will occur again and those that are not followed by satisfaction become less likely
  - Reinforcer: A stimulus that is contingent upon a response and that increases the probability of that response occurring again (Food oppose to the response from the food)
  - Positive Reinforcement: Stimulus added or increased, increases likelihood of response (getting allowance for making bed)
  - Negative Reinforcement: Stimulus removed or decreased, increases response (Opening umbrella to stop rain, will repeat action next time it rains)
  - Avoidance Learning: A specific type of negative reinforcement that removes the possibility that a stimuli will occur (paying bills on time to avoid late fees, detour to avoid traffic)
  - Escape Learning: A response removes a stimulus that is already present (Covering ears when music comes on)
  - Primary Reinforcers: Satisfies basic human survival needs
  - Secondary Reinforcers: Only have an effect when we learn the value
  - Discriminative response: A cue or event that indicates a response, if made, will be reinforced (Before pouring coffee, check if light is on, tells us it is hot also, borrowing car when you can indicate parents mood)
- Punishment: A process that decreases the future probability of a response
  - Punisher: A stimulus that is contingent upon a response that will decrease behaviour
  - Positive Punishment Stimulus is added or increased, decreases the response (Dog jumps, gets yelled at, less likely to do it again)
  - Negative Punishment: Stimulus is removed or decreased, decreases the response (A parent takes away TV privileges to stop the children from fighting)
- Shaping: Specific operant response is created by reinforcing approximations of that response (Step by step learning)
- Schedules of Reinforcement: Rules that determine when reinforcement is available
  - Continues Reinforcement: Every response made results in reinforcement (vending machine)
  - Partial Reinforcement: Certain number of responses are rewarded or a certain amount of time must pass before reinforcement is available (4 types)
    - Fixed ratio schedule- response delivered after a certain amount of completed

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- Variable Ratio Schedule - Number of responses required to receive varies according to an average age
- Fixed interval Schedule - Reinforces the first response occurring after a set amount of time passes
- Variable interval schedule- First response is reinforced following a variable amount of time
- Partial Response Effect: Phenomenon in which organisms that have been conditioned under partial reinforcement resist extinction longer than those conditioned under partial reinforcement resists extinction longer than those conditioned under continuous reinforcement

### Applying Punishment Model

Punishment	Description and Explanation
Severity	Should be proportional to offence
Initial Punishment Level	Sufficiently strong to reduce recurrence
Contiguity	Most effective when it occurs immediately after behaviour
Consistency	Punishment should be administered consistency
Show Alternatives	More successful and side effects are reduced if the individual is clear on how reinforcement can be obtained

### **7.1: Memory System (Only to page 277)**

#### The Atkinson-Shiffrin Model

- Stimulus
- Sensory Organs (Transduction)
- Control process: Shift information from one memory store to another
- Stores: Retain information in memory without using it for any specific purpose
  
- Attention: Selects which information gets passed to the STM
- Encoding: Storing information in the LTM
  - Automatic: Unconscious
  - Effortful: Requires attention and conscious effort (Chunking, Mnemonics,
- Retrieval: Brings information from the LTM back into the STM

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(1) Sensory Memory: Holds information for a very brief amount of time

- Iconic memory:
  - Visual form of sensory memory that is held for about a fraction of a second
- Echoic memory
  - Auditory form of sensory memory that is held for about 3-5 seconds

(2) Short-Term Memory: Associates new with old information (Less than a minute)

- Limited in duration (Magical number, 7 units of information), after 3 seconds, only 50% is recalled and after 1 minute, nothing is remembered

(3) Long-Term Memory: Holds information for a long period of time, if not permanently

- Proactive Interference: A Process in which the first information learned occupies memory, leaving fewer resources left to remember the newer information
- Retroactive Interference: Information overshadows some older memories that have not yet made it into long-term memory
- Hierarchies: Broad topic, organized into smaller (Organized encoding, outlines, headlines)
- Distributed practice: Information is better retained when rehearsal is distributed over time
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### **7.2: Encoding and Retrieving:**

Rehearsal

- Maintenance rehearsal: Prolonging exposure to information by repeating it
- Elaborative Rehearsal: Prolonging exposure to information by thinking about its meaning

Levels of Processing

- Immediate
  - Shallow
  - Intermediate
  - Deep
- Delayed
  - Shallow
  - Intermediate
  - Deep

Recognition: Identifying a stimulant when presented to you

Retrieval: Retrieving information when asked but without that information being present during the retrieval process

Recall: Hints/recall cues

“Encoding specificity principle”: Retrieval is most effective when it occurs in the same context as encoding

### **7.3: Constructing and Reconstructing Memories**

### **9.1: Measuring Intelligence**

Intelligence = The ability to think, understand, reason, and adapt to or overcome obstacles

Approaches To Testing Intelligence

- Galton's Anthropometric Approach
  - Anthropometrics = The measurement of people, measuring physical and mental variation in humans
  - Galton's approach we abandoned
- The Stanford-Binet Test
  - A test intended to measure innate levels of intelligence
  - Intelligence quotient = IQ
  - Calculated by taking a person's mental age and dividing it by his chronological age than multiplying by 100
- Wechsler Adult Intelligence Scale (WAIS) //Modern IQ Testing
  - IQ test for adult populations
  - Broke down into Verbal: General ability index(verbal comprehension) and Cognitive proficiency index (Working Memory)
  - Performance: Perceptual Reasoning (General Ability Index), Perceptual Speed (Cognitive proficiency Index)
  - Uses: Children with large discrepancies between 4 different sections on IQ test, and to identify gifted and IEP kids
  - Costly, taken seriously
  - IQ 50: 3% (Mentally retarded) - 120: 11% Superior, 100 is average 47%
- Raven's Progressive Matrices
  - An intelligence test that is based on pictures not words, thus making it relatively unaffected by language or cultural background "Culture Free"

Full Scale IQ

→ General Ability Index

- Verbal Comprehension Index → Similarities, vocabulary, Information
- Perceptual Reasoning Index → Block Design, Matrix reasoning, visual puzzles

→ Cognitive proficiency Index

- Working Memory Index → Digit span, Arithmetic
- Perceptual Speed Index → Symbol search, Coding

Past Of Intelligence : Galton

- Wanted to measure Natural Mental Abilities
- Eugenics Movement
  - Eugenics = Good genes
- Race
  - Stereotype Threat = Which occurs when negative stereotypes about a group cause group member to underperform on ability tests
- Charles Darwin's cousin
  - Applied intelligence to survival of the fittest
- Nature vs. Nurture

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Binet

- Observed that dull children perform like younger children and bright children like older
  - The concept of mental age
- Used test to judge Mental Judgment
  - Direction, Adaption, Criticism

Entity Theory: Belief that intelligence is a fixed characteristic and relatively difficult to change

Incremental Theory: Belief that intelligence can be shaped by experience, practice, and effort

Unitary Trait: Sees intelligence a single, global, mental, capacity

- The G Factor
  - Intelligence is a General mental capacity
  - Spearman
- Multifaceted
  - Crystallized (Ge) vs. Fluid Intelligence(Gf)
  - 6 - 9 distinct types of intelligence
  - Guilford's Structure of intelligence
  - Sternberg's triarchic theory

Sternberg's Triarchic Theory:

- Analytical: Book smart
- Practical: Street smart
- Creative: Creativity

### **9.2: Understanding Intelligence**

Factor Analysis: Statistical technique that examines correlations between variables to find clusters of related variables

Spearman's General Intelligence Factor:

- Abbreviation "G"
- G = Persons "Mental Energy" Reflecting his belief that some people's brains are simply more "Powerful The Others"

### **11.1: Hunger and Eating**

Motivation: Concerns the physiological and psychological processes underlying the initiation of behaviours that direct organisms toward specific goals (Motives: Thoughts, feelings, sensations leading to goal directed behaviour)

- Drive: A biological trigger/internal tension that triggers us on what we may be deprived of causing us to seek out what is needed (Hunger, thirst, horny)
- Homeostasis: A state of psychological processes that allow it to maintain consistent states in response to the outer environment
- Allostasis: Motivation is not only influenced by current needs, but anticipation of future needs
  - Drive (Water because thirst) → Behaviour (Drink)
  - Incentive (Sweet pop) → Behaviour (Drink for good experience)

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Sensors

Lipids

Glucose:

- Sugar that serves as a primary energy source for the brain and the rest of the body
- Sensors: Hypothalamus, liver
- When blood glucose decrease
  - Liver converts nutrients to glucose
  - Hypothalamus triggers hunger
- When Blood glucose increase
  - Liver stops converting nutrients
  - Hypothalamus triggers satisfaction (Station: No longer feel the need to eat)

Peptide Hormones/Neurotransmitters

- PPY
  - Release from large intestine
  - In response to food intake
  - Causes decrease hunger
- CCK
  - Released from upper small intestine
  - In response to food intake
  - Causes decrease in hunger
- Ghrelin
  - Released from Stomach
  - Response to Absence of food
  - Causes increase in hunger
- Leptin
  - Released from fat cells
  - In response to nothing
  - Results in decrease in hunger
- PYY/CCK: Short term suppression of hunger between meals
- Leptin: Long-term suppression of hunger in response to abundance of stored energy
- Orexin
  - Released by Hypothalamus
  - In response to hormone nutrient levels
  - With a result of food-seeking behaviour

Influences on Eating

- Biological
  - Appetite hormones
  - Attraction
- Psychological Influences
  - Sight and smell of food
  - Stress and mood
- Socio-cultural influences

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- Culturally learned preferences
- Social facilitation = Eating more
- Impression management = Eating less
- Modeling = Eating whatever they eat
- Evolved to eat, evolution: Motivation to eat when food is available, regardless of internal energy state

Obesity: disorder of positive energy balance, in which energy in > energy out

- Mechanisms
  - Sight of smell/food = drop in blood glucose = hunger/eating
- “The reward system”
  - Brain system that makes eating and other behaviours pleasurable
  - Dopamine, hypothalamus
- Can be a dysfunction in the reward system
  - Fewer dopamine receptors in obese people
  - While drinking milkshakes, reduced activity for obese
  - Hypothesis: When dopamine is deficient, more eating is required to get reward
- Nature
  - Innate dopamine deficiency → Overeating
- Nurture
  - Overeating → Dopamine deficiency
- Addiction
  - Food, drugs
  - Pleasure reward system

Appetite Stimulation

- Cannabinoid (CB) Receptors are widely distributed in the brain, including the reward system (Nucleus accumbens)
- CB's are administered directly to NA induced 'Pleasure'
- Increases pleasure of eating

Appetite Suppression

- Stimulants
- CB blockers
- Stimulate flight or fight nervous system
- Rimonabant

Eating Disorder

- Anorexia Nervosa
  - Self starvation
  - Intense fear of weight gain and dissatisfaction with one's body
  - Denial of the serious consequences of severely low weight
- Bulimia Nervosa
  - Eating disorder characterised by periods of food deprivation
  - Binge-eating and purging

### **10.1: Physical Development From Conception Through Infancy**

Developmental Psychology: Study of human physical, cognitive, social, and behavioural characteristics across the lifespan

#### Studying Development

- Longitudinal Design: Follows the same individual through time, repeatedly over some subset of their lifespan
- Cross-Sectional Design: Individuals from different age groups are studied at the same point in time
- Sequential Design: Individuals from different age groups are repeatedly tested over some subset of their lifespan

#### Fertilization and Gestation

- Germinal Stage
  - First phase (0-2 weeks)
  - Spans from conception, shortly after the zygotes begin dividing and a ball of blastocysts which split and develop into the fetus
- Embryonic stage
  - Weeks 2-8
  - Embryo begin developing major physical structures such as heart, nervous system, and forming arms, legs
- Fetal Stage
  - 8 Weeks - Birth
  - Skeletal organs and nervous system become more developed and specialized
- Teratogens: Substances, such as drugs or environmental toxins that impair the process of development
- Fetal Alcohol Syndrome: Involves abnormalities in mental functioning, growth, and facial development from alcohol use
- Preterm Infants: Born earlier than 36 weeks

#### High Amplitude Sucking Method

- Infants given a special pacifier that calculates sucking rate

#### Visual Stimuli

- A 2 month old can distinguish red from green
- Vision accuracy
  - 1 month - 20/120
  - 2 month - 20/60
  - 6-8 months - 20/30
- Infants prefer moms face, patterns

#### Motor Development

- Reflexes
  - Rooting reflex - stimulating the corners of the mouth

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- Moro Reflex - Startle when lose support of their head
- Grasping - Infants palm

### Synaptic Pruning Process

1. At birth, infants brain has a complete set of neurons but not many synaptic connections
2. During the first year, the axons grow longer, the dendrites increase in number, and a surprise of new connections is formed (Synaptogenesis = Forming of new synaptic connections)
3. Over the next few years, active connections are strengthened while unused connections disintegrate

### **10.2: Infancy and Childhood: Cognitive and Emotional Development**

Cognitive Development: Study of changes in memory, thought, reasoning

Assimilation: People fit new information into the belief system they already process (Incorporat)

Accommodation: People modify their belief system based on experience (Adjust)

### Piaget's Stages Of Cognitive Development

- Schemas = Generalizations about the world

Zone of proximal Development: Development is ideal when children attempt skills and activities that are just beyond what they can do alone but have guidance who are attentive to their progression.

Scaffolding: A highly attentive approach to teaching in which the teacher matches guidance to the learners needs

Theory of mind: ability to recognize the thoughts, beliefs, and expectations of others and to understand that these can be different from one's own

Stage	Description
Sensorimotor Stage (Birth - 2)	<ul style="list-style-type: none"><li>- Understands world through sensory experiences and physical interactions with objects</li><li>- Object Performance: Objects continue to exist even when they can no longer be seen</li></ul> <p><u>Substages</u></p> <ol style="list-style-type: none"><li>1) birth - 1 month = focus on reflex, no OP</li><li>2) 1 - 4 = random reflex leads to action, no OP</li><li>3) 4-8 = Random event (not reflex) Leads to action, <b>Beginning of OP</b></li><li>4) 8-12 = Need precedes action, OP, but easily confused</li><li>5) 12-18 = Trial and error problem solving, OP more developed, still not complete</li><li>6) 18-24 = first stages of symbolic functioning, OP complete (Invisible displacement)</li></ol>
Preoperational Stage (2-7yr.)	<ul style="list-style-type: none"><li>- World represented symbolically through words and mental images</li><li>- Egocentrism = Inability to understand anyones reality but one's own</li></ul>

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	<ul style="list-style-type: none"><li>- Conservation = Knowledge that the quantity or amount of an object is not the same as the physical appearance of that object (age 7)</li><li>- Animism animates material universe</li></ul>
Concrete Operational Stage (7-11/12)	<ul style="list-style-type: none"><li>- Easily performs basic mental operations involving tangible problems and situations</li><li>- Can reverse, categorize, order items</li><li>- Acquires <u>Concrete Logical Thinking</u></li></ul>
Formal Operational Stage (11/12 +)	<ul style="list-style-type: none"><li>- Can think logically about concrete and abstract problems</li><li>- Can discuss abstract moral and political theories</li><li>- Able to form and test hypothesis</li></ul>

Core Knowledge Hypothesis: Infants have inborn abilities for understanding some key aspects

Habituation: Refers to a decrease in responding with repeated exposure to an event

Dishabituation: An increase in responsiveness with the presentation of a new stimulus

Attachment: Emotional bonds

Ainsworth "strange situation" a way of measuring infant attachment by observing how infants behave when exposed to a different experiences that involve anxiety and comfort

1. Secure attachment: "checking in" for reassurance as they explore the room
2. Insecure attachment:
  - Anxiety/Resistance
    - Mother is a base of security, upset when leaves the room
  - Avoidance
    - Acts like she does not need the caregiver
3. Disorganized: instability that child has learned, typically from abuse that caregivers are both sources of fear and comfort

Humans possess two psychological behavioural systems

1. Attachment Behavioural System: Focused on meeting our own needs for security
2. Caregiving Behavioural System: Meeting the needs of others

Introjection: Internalization of conditional regardless of significant other

Inductive discipline: Which involves explaining the consequences of a child's actions on other people, activating empathy for others feelings

Kohlberg's Stage Theory: Analyzed responses to ethical dilemmas

Level 1: Preconventional Reasoning

- Stage 1
  - Focuses on punishment
  - Won't write others exam cause might get caught and expelled
- Stage 2
  - Focuses on anticipated rewards and doing what's in one's best interest
  - Won't write exam because nothing in it for him]

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Level 2: Conventional Reasoning

- Stage 3
  - Good boy orientation
  - Won't because parent will disapprove
- Stage 4
  - Social order orientation
  - Won't because the policy of no cheating

Level 3: Postconventional Reasoning

- Stage 5
  - Legalistic orientation: Justice
  - Won't write exam because the rights of other students will be compromised
- Stage 6
  - Universal Abstract Principle
  - Will because friends health and wellbeing is more important than exams