ALHT106 – Psychology for Allied Health

Learning Outcomes
1. Describe the scientific approach of modern psychology and principles for generating knowledge. (GA 4, 5)
2. Explain principles of major learning theories in psychology; identify implications for understanding behaviour in health settings. (GA 1, 4, 5)
3. Describe the main theories of human memory and some of their implications for understanding behaviour in health settings. (GA 5, 8, 9).
4. Explain the major theories of motivation and emotion and their use in helping to explain allied health practices. (GA 1, 4, 5)
5. Through participation in a group work exercise, identify and describe group work principles used, and their link to theory (GA 1, 4, 5, 7)
6. Locate/extract appropriate info from electronic health databases in preparing an essay using relevant academic conventions. (GA 7, 8, 9)

Introduction to Psychology

Psychology: study of the human mind and behaviour including science, behaviour and mental processes.

A person requires attention to their: biology, psychological experience, cultural context

Structuralism (theoretical) → emphasises conscious thought, classification of mind structurally; uncover basic elements of consciousness

Functionalism (applied) → function of mind, reasoning behind thought processes; attempts to explain psychological processes (their role)

Contemporary Psychology Perspectives

<table>
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<tr>
<th>Perspective</th>
<th>Key Figures</th>
<th>Basic Principles</th>
<th>Methodology</th>
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<tr>
<td>Psychodynamic</td>
<td>Sigmund Freud</td>
<td>Behaviour largely result of unconscious processes, motivation and early experiences - actions determined by connection of thoughts, feelings, wishes - mental events occur outside conscious awareness - mental processes conflict resulting in compromise</td>
<td>Case study, observation of thoughts, feelings and actions</td>
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<tr>
<td>Behaviourist</td>
<td>Pavlov – animals: 2 events combined form unique results Watson – extended question to humans Skinner – focus on external stimuli, causes and consequences of a particular action</td>
<td>Behaviour learned and selected by its environmental consequences</td>
<td>Experimental, imperialism, more structured</td>
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<tr>
<td>Humanistic</td>
<td>Maslow: basic physical needs → needs for safety/security → develop relationships Rogers: observed then client underwent own motivation, emphasises self-actualisation (people motivated to reach full potential)</td>
<td>Behaviour and experience shaped by need to self-actualise, to fulfil inner potential</td>
<td>Person-centred therapeutic approach, respect and acceptance of individual</td>
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<td>Cognitive</td>
<td>Rene Descartes – early philosophical questions led cognitive psychologists to emphasise role of reason in creating knowledge</td>
<td>Behaviour is product of info processing; storage, transformation and retrieval of data - Word recognition model (McClelland) - Working memory model (Baddeley)</td>
<td>Experimentation, scientific, empirical</td>
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<tr>
<td>Evolutionary</td>
<td>Charles Darwin – natural selection, adaptive traits</td>
<td>Focus on adaptive aspects of psychology and how adaption to environment shapes behaviours and mental processes</td>
<td>Deductive, comparative, experimental</td>
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Subdisciplines in Psychology

Biopsychology - physical basis of psychology phenomena
Personality - impact on their reaction, disorders, impact of thoughts, feelings and behaviours on personality

Developmental - of thought, feelings and behaviour across lifespan
Industrial/Organisational - behaviour of individuals in organisations and solve organisational problems

Social - individual and group interaction, theoretical approach i.e. when do people behave aggressively
Educational - psychological processes in learning in educational settings

Clinical - nature and treatment of psychology processes resulting in distress e.g. mood disorder
Health - psychology factors in health and disease

Counselling - diagnosis/treatment to individuals, couples, families, groups, organisations

Forensic - prevention and treatment of criminal behaviour
Conservation - reciprocal relationships between humans and nature
Research

**Theoretical framework:** systematic way of organising, explaining observations

**Standardised procedures:** all participants exposed to as similar procedures as possible, variation introduced to test hypothesis

**Generalisability:** study that is internally valid (design) and externally valid (applicable to situations outside lab), sample that represents population

**Objective measurement:** reliability (consistent results), validity (accurately assess construct intended to measure), repetition

**Evidence based practice:** empirical methodology used to gain knowledge, methods below

<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
<th>Uses and advantages</th>
<th>Potential limitations</th>
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<tr>
<td>Experimental</td>
<td>Manipulate variables to assess cause and effect</td>
<td>- demonstrates causal relationships</td>
<td>- generalisability outside lab</td>
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<td></td>
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<td>- can be repeated</td>
<td>- complex phenomena not readily tested</td>
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<td>- maximises control over variables</td>
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<tr>
<td>Descriptive: case</td>
<td>In-depth observation of small number of cases</td>
<td>- psychological processes in individual cases</td>
<td>- generalisability</td>
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<tr>
<td>study</td>
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<td>- study of complex phenomena</td>
<td>- replicability</td>
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<td>- provides data useful to frame hypotheses</td>
<td>- researcher bias</td>
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<tr>
<td></td>
<td></td>
<td>- generalisability</td>
<td>- can’t establish causation</td>
</tr>
<tr>
<td>Descriptive:</td>
<td>In-depth observation of phenomenon as it occurs in nature</td>
<td>- phenomena as they exist outside lab</td>
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<tr>
<td>naturalistic</td>
<td></td>
<td>- study of complex phenomena</td>
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<tr>
<td>observation</td>
<td></td>
<td>- provides data useful in framing hypothesis</td>
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<tr>
<td></td>
<td></td>
<td>- generalisability</td>
<td></td>
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<tr>
<td>Descriptive:</td>
<td>Asking people questions re. attitudes, behaviours</td>
<td>- reveals self-reported behaviours of large sample of people</td>
<td>- self-report: may not be accurate</td>
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<tr>
<td>survey research</td>
<td></td>
<td>- quantification of attitudes and behaviours</td>
<td>- can’t establish causation</td>
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<tr>
<td></td>
<td></td>
<td>- generalisability</td>
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<tr>
<td>Correlational</td>
<td>Examines extent to which two or more variables are related, used to predict</td>
<td>- reveals relationships among variables outside laboratory</td>
<td>- cannot establish causation</td>
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<tr>
<td></td>
<td>one another</td>
<td>- allows quantification of relationships among variables</td>
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**Learning and Behavioural Analysis**

**Learning:** the acquisition and modification of knowledge, skills, strategies, beliefs, attitudes and behaviours. It involves cognitive, linguistic, motor and social skills and can take many forms. [Schunk, 2000]

- Linguistic: new language/jargon
- Motor: manual handling, handling clients
- Social: range of people we deal with, professional practice

**Learning Theories**

Two main aims:
- Conceptual framework that attempts to systematise what is known about learning, to understand if the same theory is relevant in different environments
- Assistance with practical solutions

<table>
<thead>
<tr>
<th>Agreed upon:</th>
<th>Variably included:</th>
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<tbody>
<tr>
<td>• Behaviourist paradigm</td>
<td>• Constructivist – through reflecting on everyday experiences, one constructs their own learning</td>
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<td>• Cognitive paradigm</td>
<td>• Humanistic – emphasises importance of the person from subjective and objective points of view</td>
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<td></td>
<td>• Social learning – observation of societal norms</td>
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<td>• Experimental – learning through discovery, exploration</td>
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<td>• Blended learning theory – face to face as well as online learning, mixed modality</td>
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<td>• Connectivism – hypothesis of learning emphasising role of social and cultural context of learning, connecting theory and practice</td>
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<td>• Multiple intelligences – individuals have strengths and weaknesses, place emphasis on their strengths</td>
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<td></td>
<td>- Linguistic, mathematical, interaction with environment, musical, visual/spatial, interpersonal, intrapersonal, naturalist (noticing subtle differences), existential</td>
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<td>• Technology/internet – text, audio, visual</td>
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**Behaviourist Approaches To Learning**

**Pavlov – Classical Conditioning** “type of learning in which a stimulus acquires capacity to evoke response originally evoked by another stimulus”

UCS - unconditioned stimulus, evokes unconditioned response w/o previous conditioning
UCR - unconditioned response, unlearned reaction to UCS w/o previous conditioning
CS - conditioned stimulus, previously neutral stimulus with acquired capacity to evoke conditioned response through conditioning
CR - conditioned response, learned reaction due to conditioning.
NS - neutral stimulus

- Implication: CR attainable by pairing CS and UCS to change behaviour (bed wetting, bell and pad)
- Extinction: of CS occurs if CS presented w/o US. Conditioned response gradually disappears (but return occasionally)
- Implication: cease pairing of CS/US to change behaviour

• Spontaneous recovery: a CR will reappear after a rest period, even after a serious of CS (no US) pairings
  - Implication: think a behaviour has ceased but it can easily return
  - Warn clients this isn’t a set back/unusual in terms of therapy

• Stimulus Generalisation: a CR to one CS seems to generalise to other closely related stimuli e.g. bells with slightly different tones
  - Implication: we don’t need to teach every skill/behaviour

• Discrimination to CS: after teaching CR, further pairings to other CS results in selective CR thus only CS most closely matching training CS elicit response
  - Implication: able to teach specificity of responses

• Second order conditioning: original pairing (CS1) linked with CS2, with repeated exposures the CR occurs only with exposure to CS2 not CS1
  - Implication: able to scaffold conditioning of responses

• Counterconditioning: pair CS that elicits fear with a stimulus (US) that elicits positive emotion (UR)
  - Implication: can replace one response to a stimulus with another
  - E.g. giving a child a lollipop after injections

Watson – Study of Emotions
Aim – expand on Pavlov to demonstrate that emotional reactions could be classically conditioned in people
Key – observation, Little Albert experiments conditioned fear
Implication – can condition negative responses to previously neutral/positive stimuli; counterconditioning may be required in allied health

Skinner – Operant Conditioning ‘nurture’ over nature
Learner is passive, acquiring skills via influences of environment. All behaviour is a learned behaviour e.g. language, riding bike.
Consequences drive behaviour.
  - Antecedent → behaviour → consequences

Changing behaviour - see theoretical constructs i.e. reinforcement and punishment

Thorndike – Connectionism stimulus → response (pre Skinner)
1. Law of effect – behaviour followed by pleasant consequences likely to be repeated (vice versa)
2. Law of readiness – series of responses can be chained together to satisfy some goal which will result in annoyance if blocked
3. Law of exercise – connections become strengthened with practice and weakened when practice is discontinued

Theoretical Constructs
Reinforcement (reinforce = to strengthen, reinforcer = any event which strengthens or maintains behaviour that it consistently follows)
1. Intrinsic vs. extrinsic
2. Primary (sleep, food, air etc.) vs. secondary (physical rewards)
3. Artificial (setting up the situation e.g. good job for same task) vs. naturally occurring (using praise in normal situation)
4. Natural (reading because you enjoy it), Logical (reasonable reinforcers, not excessive) and Arbitrary (reading for a reward)
Categories of Potential Reinforcers:
1. Tangible – touch and feel
2. Consumable - lollies
3. Social – hug, attention, approval
4. Activity – get to engage in a particular activity after desirable activity
5. Token – after a certain number, a bigger reward achieved e.g. stickers
6. Intrinsic – do it for yourself

Factors Influencing Reinforcer Effectiveness:
1. Deprivation – work harder for reinforcer if they haven’t had it in a while
2. Satiation – too many reinforcements
3. Immediacy – otherwise link between act/reinforcer dissipates
4. Amount - varying
5. Schedule – reinforce varying times/days
6. Concurrent Schedules – multiple schedules in place

Reinforcement Schedules:
• Continuous reinforcement schedule – reinforce all correct responses
• Extinction schedule – reinforce no instances of the response
• Intermittent reinforcement schedule – reinforce some correct responses (fixed or variable ratio)

Shaping
Concepts of shaping include:
• Differential reinforcement, for some but not other
• Reinforcement criterion which is gradually changed (alter reward with improvements)
• Specify behavioural objective, specify starting behaviour, sequence of learning steps, find reinforcer, start training on first step, decide when to advance, backtrack if necessary, repeat until objective achieved, intermittent reinforcement

Chaining
Chaining – linking behaviours together to achieve a final result
• Initially, conduct a task analysis to determine different components of sequence via observation, self-completion, writing list of components
• i.e. chain of steps to make a cup of coffee
• Forward chaining – start at first step of task
• Reverse chaining – do first steps and leave last step, teach that step and learner completes task and gets reinforced = useful in real life situations, more reinforcing and less time consuming

Prompting and Fading
Prompting – induce person to perform desired behaviour by presenting prompt
  o Physical – manual guidance
  o Auditory – verbal, non-verbal auditory cues (alarm, notes)
  o Visual – gestural, pictorial, modelling/limitation
Fading – wean an individual off prompts by gradually reducing strength of prompt
1. Pair desired stimulus and prompt
2. Reinforce correct responses
3. Start fading prompt
4. Continue reinforcement of correct responses
5. Probe occasionally to see if transfer of stimulus control is complete
6. Stop if successful, if not repeat 3-5 until successful
7. Gradually shift to intermittent schedule of reinforcement

Weakening Behaviour
1. Extinction
   → Withholding reinforcer for previously reinforced response to cause ↓ in level of response
   → Initial effects – extinction burst (initial temporary ↑ in undesirable response/emotional behaviours)
2. Differential reinforcement:
   → Incompatible behaviour (DRI) – suggest tasks which are physically incompatible with behaviour
   → Alternative behaviour (DRA) – reinforce any behaviour alternative
   → Other behaviour (DRO) – only reinforce if behaviour isn’t shown for an amount of time
   → Low rates (DRL) – reinforce smaller amounts of bad behaviour
3. Punishment type 1
   → Simple overcorrection – make them correct results of misbehaviour
4. Overcorrection – positive practice (make them do task twice), restitution (additional task to do, improve the stakes)

Punishment type 2

- Time out from positive reinforcement – move to less reinforcing environment
- Response cost – removal of something desirable i.e. dessert, TV

**Implications for Health Professionals**

- Manipulate a stimulus, individual’s response and their own response (reinforce, ignore etc.)
- Premack principle: opportunity to engage in a high probability behaviour may be used to reinforce lower probability behaviour

**Cognitive-Social Theory**

- A combination of social learning and cognitive paradigm plus behaviourism
- Proposes that individuals learn many things from people around them, with or without reinforcement via social learning mechanisms
- Concepts:

  - Cognitive maps
  - Latent learning
  - Insight
  - Expectancies
  - Learned helplessness
  - Explanatory style

**Social Learning Theory**

- Observational learning, *modelling* (person learns to reproduce behaviour exhibited by a model)
- Three concepts at the centre of social learning theory:
  - Learning through observation
  - Internal mental states essential
  - Learning doesn’t necessarily result in behaviour change
- *Vicarious conditioning* (learning consequences of an action by observing its consequences for another)
- *Tutelage* (teaching concepts primarily through verbal explanation)
- The individual active in learning process; most human behaviour is acquired by observation
- An individual’s learning and performance depends on
  - Motor reproduction
  - Motivation
  - Attention
  - Retention
- Bandura: reciprocal determinism in 1986
  - Individuals, their behaviours and social environment are dynamically bound together
  - Individuals: self-identity, self-esteem, self-efficacy, expectancy
  - Overt behaviour: actions and performance level
  - Social environment: distinctive group conceptions, social status, social interactions
- Learning occurs within the social spheres and context of:
  - Family: first experiences within family, children model behaviour and attitude on family
  - Peer groups: interact, behave, conform in socially acceptable ways
  - Community groups: normative (religious/belief), civil (political, charity), interest (sport, photography), vocational

**Bandura: ‘Bobo Doll Experiment’ on children’s aggressive behaviour in 1961**

- Investigation into whether social behaviours can be acquired through imitation
- 1/3 children watched adult behave aggressively towards blow up toy; 1/3 exposed to non aggressive behaviour towards doll; 1/3 not exposed to any model at all
- Children brought into another room with aggressive and non aggressive toys; behaviour observed in one way mirror every 5 secs
- Children with aggressive models acted more aggressively; boys are likely to imitate same-sex models than girls; boys acted more physically aggressive than girls; verbal aggression similar between groups
- Findings support Bandura’s Social Learning Theory – social behaviour learned through observational learning
- Implications for effect of media violence on children

**Implications**

| Health professionals | Learning should be facilitated whenever process of motivation to attend to target behaviour and improve retention of *modelled* event incorporated
| Select model with whom individual closely identifies, advise them to model target behaviour, reinforce model for correct attempts at behaviour, later encourage individual to do behaviour, reinforce individual for correct behaviour productions |

| Promote role of families | Establish communication links with families
| Make family members welcome
| Five family active role in task to help individual’s learning
| Explain terms of therapy to family
<p>| Involve family as educators and role models |</p>
<table>
<thead>
<tr>
<th>Cognitive Approaches To Learning</th>
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<tbody>
<tr>
<td>Cognitiveism: theory that attempts to answer how/why people learn by attributing processes to cognitive activity</td>
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<tr>
<td>Focus on perception, memory and concept formation, ↑ engagement in hypotheico-deductive scientific inquiry</td>
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<tr>
<td>Implication for health professionals:</td>
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<tr>
<td>- Cues us to ask why someone can’t complete a task</td>
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<tr>
<td>- Cognitive factors: language issue, memory issue, processing speed, executive functioning (planning problem, sequencing, reasoning, attention)</td>
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<tr>
<td>- Motivation and emotion: personality, ICF (international classification of functioning) personal factors</td>
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<tr>
<th>Experiential Learning and Constructivism</th>
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<tr>
<td>Experiential – learning through action, doing, experience, discovery and exploration</td>
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<tr>
<td>Constructivism – explains how people acquire knowledge and learn, from experiences</td>
</tr>
<tr>
<td>Kolb’s Cycle of Experiential Learning ➔ Kolb – implications:</td>
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<tr>
<td>- Difference between you and your peers, lecturers, professional practice educators, client</td>
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<th>Piaget and the Origins of Intelligence</th>
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<tr>
<td>Intelligence seen as evolving with physical maturation and experience, three fundamental principles:</td>
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<tr>
<td>1. Equilibrium</td>
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<td>2. Organisation</td>
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<td>3. Adaption</td>
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<tr>
<td>Implications:</td>
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<tr>
<td>- Create disequilibrium to challenge client</td>
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<tr>
<td>- Encourages problem-solving and analysis</td>
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<td>- Provides physical, interactive, manipulative tools to work with</td>
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<td>- Allows exploration of environment</td>
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<tr>
<th>Vygotsky: Zone of Proximal Development (ZPD)</th>
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<tr>
<td>Implications:</td>
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<tr>
<td>- Guided learning: joint knowledge constructed by client and clinician by clinician managing learning</td>
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<td>- Scaffolding: provide appropriate supports to help clients construct new knowledge ➔ Clinician provides scaffolds ➔ Teach client to self-scaffold e.g. self-talk ➔ Remove scaffolds as client learns task ➔ Re-introduce scaffolds if task is altered</td>
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<tr>
<td>Learning Style</td>
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<tr>
<td>Deep Learning</td>
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<td>Surface Learning</td>
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<td>Strategic Learning</td>
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**Behaviour Change**

Select target behaviour → identify contingencies (antecedents, consequences) → measuring and recording behaviour (narrative recording, counting, timing, checking, rating)

1. Precontemplation
2. Contemplation
3. Preparation
4. Action
5. Maintenance or termination

**Sensation and Perception**

**Sensation**: body gathers information about environment, transmits info to brain via electrical energy for initial processing

**Perception**: active process, by which the brain selects, organises and interprets sensory information

Outline the three basic principles and processes that apply across all senses

1. No one-to-one correspondence between physical and psychological reality
2. Sensation and perception are active processes, where energy is converted into an internal representation
3. Sensation and perception are adaptive, serving a functional purpose to facilitate survival and reproduction

Describe the processes common to all sensory systems

- Detect physical energy e.g. light waves
- Transduction: translate physical stimulation into neural signals
  → Process of transforming one form of energy into another
  → Sensory receptors specialised to respond to environmental energy, which is converted into neural impulses which are interpreted by brain
  o Visual (light entering eye), auditory (pressure changes in air), touch (pressure transmitted through skin), smell (chemicals enter nose), taste (chemicals enter mouth)
- Threshold: each system requires a minimum amount of energy to activate the system
  → Signal detection theory proposes two distinct processes required for detecting a stimulus:
    o Initial sensory process: observer’s sensitivity to stimulus
    o Decision process: observer’s response bias
  → People differ in time it takes to reach threshold e.g. pain thresholds
- Sensation involves efficient and automatic decision making
- Sensory systems are sensitive to changes in stimulation level
  → Tendency of sensory systems to respond less to stimuli that continue without change
  → Makes sense from evolutionary perspective; constant sensory input provides no new information about environment
  → Habituating to stimuli useful, only respond to useful cues

Explain how light wavelengths are transformed into vision and colour

**Light**

- Electromagnetic spectrum is a continuum of electromagnetic energy – produced by electric charges and radiated as waves
- Visible light ranges from 400-700 nanometres

**Eye**

- Contain receptors for vision
- Light enters via pupil, focused by the cornea and lens to form sharp images of objects on the retina

**Retina**

- Visual receptors, rods and cones contain light sensitive chemicals (visual pigments) which respond to light and trigger electrical signals which travel via optic nerve to brain
- Shape: rods are large and cylindrical, cones are small and tapered providing detailed vision
- Distribution on retina: image falls on fovea consisting of cones, periphery has more rods than cones
- Approximately 120 million rods, 6 million cones
- Information processing: signals generated travel to bipolar cells then to ganglion cells. Ganglion axons transmit signals out of retina in optic nerve
**Blind Spot**
- Area in retina containing no receptors
- Located off side of visual field
- A mechanism in brain fills in place where image disappears

**Visual pathways**
- Signals transmitted via optic nerve to lateral geniculate nucleus (LGN, group of neurons) of thalamus
- Signals then travel to visual receiving area in striate cortex

**What (ventral) and Where (dorsal) pathways**
- From primary visual cortex, visual info flows along two processing streams
- What: involved in determining what an object is, incorporates temporal lobe, neutral stream
- Where: locating object in space, follows its movements, guiding movement towards it, dorsal stream

**Perceiving in Colour**
Brightness – intensity of colour; Hue – type of colour; Saturation – purity of colour, adding white reduces saturation
Retinal transduction of colour – cones with different photosensitive pigments respond in varying degrees to different wavelengths of the spectrum, cone receptors fatigue after prolonged staring

**Theories of Colour Vision**
- Trichromatic Theory (Young-Helmholtz)
  → Colour is explained by differential activation of 3 colour receptors in eye
- Opponent-Process Theory
  → Colours derived from activity of 3 antagonistic systems (black-white, red-green, blue-yellow)
- Both theories are complementary: Trichromatic applies to retina, Opponent-Process applies at higher visual centres in brain

**Explanation of sound waves transformed into hearing**

**Sound**: pressure changes in the air or other medium (physical); is the experience we have when we hear (perceptual)

**Pressure changes**
- Vibrations cause pressure changes in air/water surrounding object
- Pattern = sound wave
- Speed of sound in air = 340 metres/second
- Hearing is the experience caused by sound waves

**Nature of Sound**
- Frequency (pitch) = times per second the pressure changes repeat, measured in Hz
- Complexity (texture) = how many frequencies
- Amplitude (loudness) = difference between high and low peaks, measured in decibels (Db)

**Outer Ear**
- Sound waves first pass here
- Consists of pinna and auditory canal
- Collects and magnifies sounds

**Middle Ear**
- When sound waves reach tympanic membrane, they cause it to vibrate
- Vibration is transmitted to structures in middle ear
- Ossicles - malleus (hammer) moves due to vibration; incus (anvil) transmits vibration of malleus; stapes (stirrup) transmits vibrations of incus to inner ear via oval window of cochlea

**Inner Ear**
- Cochlea – fluid-filled, snail-like structure approx. 35mm long
- Semicircular canals

**Transduction** (action of cochlea)
- Movement of stapes creates pressure changes of liquid in cochlea
- Cochlear partition moves in up and down motion
- Motion causes Organ of Corti to vibrate and the tectorial membrane to move
- Motion causes cilia of inner hair cells to bend
- Triggers action potentials in sensory neurons forming auditory nerve, which transmits auditory info to brain
Sensing Pitch
- Place theory
  → Different areas of the basilar membrane are maximally sensitive to different frequencies
- Frequency theory
  → Basilar membrane vibrates more frequently based on frequency of sound waves

Neural Pathways
Sensory information transmitted along auditory nerve, ends up in auditory cortex of temporal lobes’

Sound localisation
Critical cues: difference in loudness, timing of sounds arriving at each ear

Distinguish the functions of smell, taste, touch, the vestibular, and kinaesthetic systems

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<tr>
<th>Olfaction/smell</th>
<th>Functions: detect danger, detect spoiled foods</th>
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<tbody>
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<td></td>
<td>Gas molecules in air, enter body through nose and mouth</td>
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<td>Smell receptors located in nasal cavities</td>
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<td></td>
<td>Transduction of smell occurs in olfactory epithelium (thin pair of structures at top of nasal cavities)</td>
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<td></td>
<td>Movement of cilia in olfactory epithelium transduces physical energy</td>
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<td>Chemical molecules in air become trapped in mucus of epithelium, they make contact with olfactory receptor cells; axons of olfactory receptors form olfactory nerves which transmit info to olfactory bulb, information travels to primary olfactory cortex deep in frontal lobes</td>
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| Taste          | Functions: protect organism from ingesting toxic substances, regulates intake of nutrients e.g. sugars and salt |
|                | Contribution of nose and mouth to taste is almost indistinguishable |
|                | Transduction occurs in tastebuds (within papillae), each containing 50-150 receptor cells |
|                | Taste receptors stimulate neurons that carry info to medullar and pons of brain, then along 1 of 2 pathways: |
|                | Leads to thalamus and gustatory complex (responds to sweet, sour, salty, bitter tastes) to enable identification of tastes |
|                | Leads to limbic system to produce immediate emotional and behavioural responses |

| Touch          | Function: protect body from injury, aid in identifying objects, maintain body temperature, facilitate social interaction |
|                | Mixture of pressure, temperature of objects, pain |
|                | Touch receptors respond to different aspects of these qualities |
|                | Pain prevents tissue damage (↓ time of injury), adaptive to a degree |
|                | When cells are damaged, chemicals released stimulating free nerve ending to transmit pain messages |
|                | Influenced by cultural beliefs, emotional states, personality (pain thresholds) |

| Vestibular     | Proprioceptive Senses: register body position and movement |
|                | Provides information about the position of the body in space by sensing gravity and movement |

| Kinaesthetic   | Proprioceptive Senses: register body position and movement |
|                | Provides information about movement and position of limbs and other parts of the body relative to one another |

Describe the various ways in which perception is organised

Perceptual Organisation:
- Organising sensory experience
- Forms perception: organisation of sensations into meaningful shapes and patterns
- Gestalt Psychologists: proposed the whole differs from the sum of its parts, perception isn’t built from sensations, but is the result of perceptual organisation, involving the grouping of elements in an image to create larger objects

Depth Perception:
- Organisation of perception in 3 dimensions
- 2 kinds of visual info provide important info about depth and distance:
  → Binocular cues: visual input integrated from the two eyes
  → Monocular cues: visual input from one eye
- Interposition, elevation, texture gradient, linear perspective, shading, aerial perspective, familiar size, relative size

Motion Perception:
- Perception of movement of objects
- Ganglion cells (motion detectors) particularly sensitive to movement

Perceptual Constancy:
- Colour: tendency to perceive object colour as stable, even under conditions of changing illumination
- Shape: we recognise an object as having the same shape despite viewing from different angle/distance
- Size: objects don’t appear to differ in size when viewed from different distance

Intelligence and Memory
Memory
Describe how information is encoded, stored and retrieved in long-term memory
Encoding - forming a memory code

• Active encoding pays crucial role in memory
• Attention to information essential to remembering, involving focusing awareness on narrow range of stimuli
• Selective attention = critical to everyday functioning, likened to a filter to screen out most stimuli
• Cognitive load influences location of attentional filter (Lavie, 2005)
• Divided attention reduces memory performance (Craik, 2001)
• Levels of processing: Craik and Lockhart (1972) proposed that incoming information can be processed at different levels: Structural, Phonemic, Semantic; deeper levels of processing result in longer lasting memory codes
• Improving encoding: elaboration (linking stimulus to other info at time of encoding), visual imagery (visual images to represent words), self-referent (whether info is self-relevant or not), motivation to remember (high motivation, greater recall)

Storage - maintaining encoded information over time

• Sensory Memory: preserves info in original sensory form for a brief time, it is adaptive, can be of visual (iconic) or auditory (echoic) info
• Full report - typically only recall 4-5 items from 12, sensation you’ve seen more by disappeared before reported
• Partial report - Sperling (1960), avoids problem of forgetting during reporting, participants don’t know which row will be selected thus report treated as representative of whole array, reported 3 items (75% of display), sensory memory capacity is virtually unlimited
• Short-Term Memory: limited capacity store that maintains unrehearsed info for 10-20 seconds
• Rehearsal - process of repetitively verbalising info to maintain in STM
• Capacity - limited to 7 (+/- 2) (Miller, 1956), when filled to capacity new info replaces old (Cowan 2005 argues it to be <7 as previous research didn’t account for chunking - grouping of familiar stimuli as one unit)
• Working Memory - more complex model of short term memory proposed by Baddeley
• Long-Term Memory: unlimited capacity store (theory - all info stored in LTM, forgetting reflects retrieval issue)
• Knowledge in memory:
  • Clustering → spontaneous organisation of information into categories for storage, Bousfield (1953)
  • Conceptual Hierarchies → multilevel classification system based on common properties among items, Bower 1970
  • Schema → organised cluster of knowledge about particular object/event
  • More likely to remember information consistent with schemas on info, Tuckey and Brewer (2003)
• Better recall of info violating schema also noted, due to increased attention and deep processing
• Semantic Networks → nodes representing concepts, joined by pathways linked topics, activation of a node spreads along pathway (spreading activation)

Retrieval - recovering information from memory stores

• Retrieval cues are stimuli that helps you gain access to memories (richer retrieval cue, easier to remember)
• Context effect - recall better when encoding and retrieval have same context, mood-dependent memory
• Reality monitoring - process of deciding whether memories are based on actual perception of events (external sources) or one’s thoughts and imaginations (internal sources)
• Source monitoring - process of making inferences about origins of memories, errors in source monitoring occur when memory from one source is misattributed to another source

Describe working memory

More complex model of short-term memory

Baddeley’s Model
- Phonological loop
  → Equivalent to STM in previous models
  → Involved in rehearsal of information
- Visuospatial sketchpad
  → Enables people to hold and manipulate visual images e.g. map out route to travel home in mind
- Central executive
  → Controls allocation, switching and dividing attention
  → Coordinates action of other components
- Episodic Buffer
  → Temporary, limited capacity store allowing components of WM to integrate information
  → Serves as an interface between WM and LTM
  → Concept of WM still contains characteristic of STM – limited capacity, storage duration
  → WM capacity is one’s ability to hold and manipulate information in conscious attention, influenced by individual differences and situational factors

ALHT106 – Semester 1 Notes
Explain why remembering, misremembering and forgetting occur
Ebbinghaus’s Curve – his study looked at memory for nonsense syllables; over time, his retention of nonsense material dropped considerably (seen in retention curve)

Why do we forget?
- Ineffective Coding
  - Typically due to lack of attention (pseudo forgetting)
  - Level of processing influences extent to which material is forgotten
- Decay
  - Attributes forgetting to the impermanence of memory storage
  - Memory traces fade over time
- Interference
  - Proposes that people forget information because of competition from other material
  - Controlled by measuring similarity between original material being tested and material studied in intervening period
  - Greatest when intervening material is most similar to test material (McGeoch, McDonald, 1931)
  - Retroactive interference: new information impairs retention of previously learned information
  - Proactive interference: previously learned information interferes with retention of new information
- Retrieval Failure
  - Encoding specificity principle: value of a retrieval cue depends on how well it corresponds to the memory code
  - Transfer appropriate processing: occurs when initial processing of information is similar to type of processing required by subsequent measure of retention

Describe the neuropsychology of memory
Those who suffer from amnesia (deficit in memory due to brain damage) provide key insights into physiology of memory
H.M.
- Medial portions of temporal lobe removed
- Resulted in ↓ convolution severity and frequency; remained emotionally stable; suffered devastating amnesia
- Our understanding of memory has been greatly enhanced by neuropsychological patient H.M
- Unable to form long-term memories, normal short-term memory (showed implicit not explicit memory)
- Showed retention of certain types of tasks, despite no conscious recollection

Systems and Types of Memory
- Declarative: facts and events
- Procedural: knowledge of procedures and skills
- Semantic: general world knowledge and facts
- Episodic: memories of particular events
- Explicit: recollection of information
- Implicit: memory expressed in behaviour that doesn’t require conscious recollection
- Prospective memory can have significant impact on current lifestyle e.g. knowledge of when to take medicine may be impaired, need for full-time carer

Outline the major types of long-term memory
Long-term memory is an unlimited capacity store
One theory proposes forgetting reflects issues in retrieval of information rather than storage
Penfield and Perot (1963)
- Memories triggered by electrical brain stimulation
- Temporal lobe stimulation → vivid descriptions of events long ago
- Assumed to be exact playbacks of long lost memories
Flashbulb Memory
- Unusually vivid and detailed recollections of circumstances where people learned of momentous events
Permanency issues
- Remarkable memories activated by EBS → involved major distortions
- Flashbulb memories → less detailed over time, often inaccurate
- No conclusive evidence of permanent storage