Chapter 1 – Psychology: The Science of Behaviour

Psychology = the scientific study of behaviour and the factors that influence it.
Taking into account Biological, Individual and Environmental factors.

Basic and Applied Science

- Two types of research:
  - **Basic research**: Knowledge gained purely for its own sake. The goals are to describe how people behave and to identify factors that influence it. Research maybe carried out in lab or real world
    - e.g. Robert Cave – Jigsaw case study - showed how competition leads to hostility but could be reduced by making them dependent on each other.
  - **Applied research**: Knowledge gained to solve specific practical problems. Uses principles discovered via basic research to solve practical problems.

Goals of Psychology

- Four basic goals: **DEuPIc**
  - *Describe* how people and animals behave
  - *Explain and understand* the causes of the behaviour
  - *Predict* how people and animals behave under certain conditions
  - *Influence or control* the behaviour through knowledge and control of causes

Importance of Perspectives

- Diverse viewpoints allows for enriched understanding of behaviour and its causes
- Six different perspectives: biological, cognitive, psychodynamic, behavioural, humanistic, and sociocultural. **PBS & HBC**
  - **Psychodynamic** - unconscious forces motivating behaviour
  - **Behavioural** - role of external environment on out action
  - **Sociocultural** - culture and behaviour relate
  - **Humanistic** - self actualization and free will
  - **Biological** - physical side of human nature, brain and genes
  - **Cognitive** - thought process

The Biological Perspective

- Focuses on the physical side of human nature
  - Emphasizes role of brain, including biochemical processes
- Mind-body dualism: The belief that the mind is a spiritual entity not subject to the physical laws that govern the body
  - No amount of research on the body could ever explain the mind
  - Ancient widely-held view, especially by Greeks
- Monism: The belief that the mind and body are one, and mental events are a product of physical events
  - Modern view by most scientists

Discovery of Brain-Behaviour Relations

- Late 1700s, Luigi Galvani discovered severed leg of frog moved with electrical current applied to it
  - Defied prior belief that bodily movements were caused by soul
- By 1870, researchers applied electrical stimulation directly to brains of animals
  - Stimulation of specific areas on brain resulted in movements of particular muscles
- Karl Lashley damaged specific regions of brain and studied effects on learning and memory abilities in animals trained to run through mazes
- In 1929, invention of electroencephalogram (EEG) allowed researchers to measure electrical activity of large areas of brain

Evolution and Behaviour

- Darwin's theory of natural selection demonstrated that inheritable characteristics that increase likelihood of survival will be maintained. Proposed that humans and apes arose from the same ancestor.
- Evolutionary psychology focuses on role of evolution in development of human behaviour
    - Psychologists stress organism's biology determine its behavioural capabilities and behaviour
- Sociobiology holds that complex social behaviours are built into human species as products of evolution
    - Natural selection favors behaviours that increase ability to pass on genes (aggression, competition, dominance in males, cooperation and nurturing in females, etc.)
    - Sociobiologists believe that one's genetic survival is more important than one's own physical survival (altruism)
    - Criticized for overemphasizing innate biological factors at expense of cultural and social learning factors in explaining complex human social behaviour

Behaviour Genetics

- Study of how behavioural tendencies are influenced by genetic factors
- Animals can be bred not only for physical, but also behavioural traits (aggression, intelligence, etc.)
- Identical twins, with identical genetic makeup, are very similar in behaviour compared to fraternal twins
    - Found even when identical twins reared in different homes

The Cognitive Perspective

- Views humans as information processors and problem solvers whose actions are governed by thought and planning. What sets humans apart is that we have mental capabilities.
    - Studies how mental processes influence our motives, emotions, and behaviour
- Several schools and individuals contributed to modern cognitive perspective:
    - **Structuralism**
        - Analysis of mind in terms of its basic elements
        - Studied sensations through introspection ("looking within") Patients were exposed to stimuli and asked to explain their experiences.
        - Wilhelm Wundt wanted to model study of the mind after physical and biological sciences. Believed mind could be studied via breaking it down to its basic parts, this was called structuralism. Believed sensations were basic elements of consciousness.
            - Founded first laboratory of experimental psychology in 1879
    - **Functionalism**
        - Psychology should study the functions of consciousness (the "why's) rather than its structure- (the What's)
        - Influenced partly by Darwin's evolutionary theory (adaption to succeed)
        - William James broad functionalist approach helped widen the scope of psychology to include biological/mental processes and behaviour
    - **Gestalt Psychology**
        - Concerned with how elements of experience are organized into wholes
            - Opposite of structuralism
        - Wolfgang Kohler concluded that ability to perceive relationships is the essence of intelligence
            - Defined "insight" as sudden perception of a useful relationship or solution to a problem
            - Demonstrated insight by observing chimpanzee use various items in a cage to reach a banana at the top

- **Jean Piaget**
  - Studied how children think, reason, and solve problems
  - Concerned with how the mind and its development contribute to our ability to adapt to our environment
- **Albert Ellis and Aaron Beck**
  - Attempted to understand how mental distortions and irrational thought patterns create emotional problems
  - Emphasized that distress and maladaptive behaviour are caused by the ways situations are thought about, not by external situations

Modern Cognitive Science

- Artificial intelligence develops computer models of complex human thought, reasoning, and problem solving
- Interested in how people produce and recognize speech and how creative solutions to problems are produced
- Social constructivism: What we consider reality is in large part our own mental creation
  - Little shared reality exists apart from what groups of people socially construct through subjective meaning they give to their experiences
  - Believe male and female sex roles created not by nature, but by shared world view that exists within social groups

The Psychodynamic Perspective

- Searches for causes of behaviour within workings of personality, emphasizing role of unconscious processes and unresolved conflicts from past
- Sigmund Freud emphasized role of complex psychological forces in controlling human behaviour
  - Focused on hysteria, condition where physical symptoms develop without organic cause
  - Found improvement in patients after they reported and relived painful childhood sexual experiences
  - Led Freud to believe that most of human behaviour is influenced by unconscious forces
  - Believed repression was a defense mechanism to keep anxiety-arousing impulses, feelings, and memories in unconscious depth of mind
  - All behaviour is a reflection of unconscious internal struggle between conflicting psychological forces of impulse and defenses
- Freud opposed laboratory research, and depended on clinical observations and personal self-analysis

The Behavioural Perspective

- Focuses on the role of the external environment in shaping and governing our actions
  - Behaviour influenced by learned habits and by stimuli in the environment
- History rooted in school of philosophy known as British Empiricism
  - All ideas and knowledge are gained empirically
  - John Locke: The human mind is initially a white paper, to be furnished by experience
  - Observation overrules reasoning, since "seeing is believing" while reasoning has potential for error
  - Pavlov found involuntary learning in dogs from external stimulus
- John Watson lead movement of behaviourism in 1920s
  - Proper subject matter of psychology is observable behaviour, not unobservable inner consciousness
  - Devoted efforts to discovering laws that govern learning and performance
- B. F. Skinner believed mental events, images, and feelings from within are behaviours and not causes
- Behaviour modification techniques alter problem behaviours and increase positive behaviours through alterations in environmental factors
- Cognitive behaviourism is an attempt to bridge gap between behavioural and cognitive perspectives

    - Environment exerts effects on behaviour by affecting thoughts
    - Mental abilities allow control of behaviour and influence of environment (control varies from environment person and person environment)

The Humanistic Perspective

- Emphasizes free will, innate tendencies towards growth, and attempt to find ultimate meaning in one's existence
    - Rejected images of behaviour control from unconscious forces
- Understand role of internal personality processes, but stress importance of conscious motives, freedom, and choice
- Active force toward growth and self-actualization (reaching individual potential)
- Terror management theory constructs reality, often involving afterlife and sense of order and stability, to have sense of personal value

The Sociocultural Perspective

- Focuses on the manner in which culture is transmitted to its members and on similarities/differences that occur among people from diverse cultures
- Culture: Enduring values, beliefs, behaviours, and traditions shared among a large group of people
- Each culture develops social norms
    - Norms: Rules that specify what is acceptable and expected behaviour
- Humans have need to develop cultures
    - Introduce order and particular world view into social system, creating predictability, guidelines for thought and behaviour, and a map for life
- Margaret Mead found striking differences in normal behaviour among men and women of three tribes
    - Cultural expectations and learning experiences can affect behaviour
- One of most important differences in cultures is emphasis on individualism vs. collectivism
    - Individualism – North America, Europe
    - Collectivism – Asia, Africa, South America

Perspectives in Historical Context

- 1879 – Structuralism (Wilhelm Wundt)
- End of 19th century – Functionalism (William James)
- End of 19th century – Psychodynamic (Sigmund Freud)
- 1920s – Behaviourism (B.F. Skinner, Ivan Pavlov, John Watson)
- 1960s – Cognitive (Allan Paivio)
- Always – Biological

Integrating the Perspectives

- Three levels of analysis for describing various aspects of behaviour and classifying casual factors: Biological, Psychological, Environmental
- **Biological**
    - Everything psychological is biological
    - Can analyze behaviour in terms of brain processes, hormones, and genetics
    - Cannot explain experiences and feelings
- **Psychological**
    - Can analyze role of thought, memory, planning, and problem solving
    - Takes into account motivational, emotional, and personality processes that influence people
- **Environmental**
    - Takes into account the environment, past and present, and personal and cultural that shape and stimulate behaviour
- Example: Depression
    - Biological – Genetic factors, disrupted brain rhythms, chemical factors
    - Psychological – Pessimism, severe losses/rejections from past

- Environmental – Non-rewarding environment, loss of social support

Chapter 2 – Studying Behaviour Scientifically

Steps in the Scientific Process

- **Initial observation/question**
- **Form hypothesis**
  - Tentative explanation or prediction about some phenomenon
  - Gather clues and logically analyze them
- **Test hypothesis**
  - Conduct research, gather evidence
- **Analyze data**
  - Analyze information and draw tentative conclusions
- **Further research and theory building**
  - Theory: Set of formal statements that explain how and why certain events are related to one another
- **New hypothesis derived from theory**
  - Theory used to develop new hypotheses, which are then tested by conducting additional research and gathering evidence
  - Allows for self-correcting theories

Two Approaches to Understanding Behaviour

- **Hindsight Understanding** – Arrive at explanations after-the-fact
  - Major limitation is due to various explanations for behaviour with no sure way to determine correct alternative
- **Understanding through Prediction, Control, and Theory Building**
  - Theory development is strongest test of scientific understanding, because good theories generate an integrated network of predictions
    - Incorporates existing facts and observations within single broad framework
    - Testable, generating new hypotheses whose accuracy can be evaluated by gathering new evidence
    - Predictions supported by findings of new research
    - Conforms to law of parsimony: If two theories can explain and predict the same phenomena equally well, the simpler is preferred
  - Theory never regarded as absolute truth, as future observation can contradict it
  - Prediction does not require understanding

Defining and Measuring Variables

- Variable: Any characteristic that can differ (Gender, age, ethnicity, etc.)
  - Certain variables can cause problems due to different meanings in different cases (Levels of intelligence, etc.)
- Operational definition: Defines variable in terms of specific procedures used to produce or measure it
  - Translate an abstract term into something observable and measurable
- Various techniques of measuring processes
  - Self-Report Measure – Ask people to report on their knowledge, beliefs, feelings, experiences, or behaviour
    - Accuracy depends on people's ability to respond honestly
      - Social desirability bias: Tendency to give answer that gives good impression rather than the truth
  - Reports by Others – Obtain reports from others who know useful information about a person
  - Physiological Measures – Biologically obtain physical reports
    - Interpretive problems don't explain emotional or thought processes
  - Behavioural Observations – Observes overt behaviours in real-life or laboratory settings
    - Requires coding system to measure diverse behaviours

        - Observers and researchers must use system identically for reliable measurements
        - Archival measures: Use of already existing records or documents to gather behavioural information
        - Humans and animals may behave differently when they know they're being observed (Solved through unobtrusive measures)

Methods of Research

- **Descriptive research** – seeks to identify how humans and other animals behave, particularly in natural settings
    - Case studies: In-depth analysis of an individual, group, or event
        - Vibrant source of new ideas and hypotheses that may be examined using more controlled research methods
        - Enables scientists to study and collect large amount of data
        - May challenge the validity of a theory or widely held scientific belief
        - Can illustrate effective intervention programs developed by clinical psychologists to treat special populations
        - Poor method for determining cause-effect relationships
        - Drawing broad conclusions from one or several case studies can be risky
        - Possible lack of objectivity in the way the researcher gathers and interprets the data
    - Naturalistic observation: Researcher observes behaviour as it occurs in a natural setting
        - Used extensively in studies of animal behaviour
        - Takes long periods of time until able to observe without interfering
        - Does not permit cause-effect conclusions about the relationships between variables
    - Survey research: Information obtained by administering questionnaires or interviews to many people
        - Population – all individuals about whom a conclusion can be drawn
        - Sample – a subset of individuals drawn from the population of interest
        - Representative sample – reflects important characteristics of the population
            - Findings closely portray population as a whole
        - Random sampling – everyone has equal probability of being chosen in sample
        - Unrepresentative samples can lead to faulty generalizations
        - Rely on self-reports
        - Can be distorted by social desirability bias, interviewer bias, or inaccurate perceptions of own behaviour
- **Correlational research** – searches for association between naturally occurring events or variables
    - Three components:
        - Researcher measures one variable (x)
        - Researcher measures a second variable (y)
        - Researcher determines statistically whether x and y are related
    - Bi-directional causality problem: situation where either x could cause y, or where y could cause x (eg. Parental warmth improves adjustment in children, or Adjusted children improve parental warmth)
    - Third-variable problem: situation where a third variable (z) is responsible for the cause-effect relationship (eg. Genetic factors cause parental warmth and adjustment in children)
    - *Correlation does not demonstrate causation*
    - Correlation coefficient – a statistic that indicates the direction and strength of the association between two variables
    - Correlational data allows predictions
- **Experimental research** – most direct method for testing explanations of cause-effect relationships
    - Three essential characteristics:
        - Researcher manipulates one variable

        - Researcher measures whether this manipulation produces changes in a second variable
        - Researcher attempts to control for extraneous factors that might influence the outcome of the experiment
    - Independent variable – factor that is manipulated by the experimenter
        - "Experimental group" receives treatment or active level of the independent variable
        - "Control group" is not exposed to treatment (purpose is to provide standard of behaviour to compare to experimental group)
    - Dependent variable – factors that is measured by the experimenter and may be influenced by the independent variable
    - Two ways to design an experiment:
        - Random assignment – equal likelihood for all participants to be in any group
            - Doesn't eliminate fact that participants differ from each other in important ways
            - Balances these differences across various conditions
        - Exposure to all conditions – each participant is exposed to all conditions
            - Important details about individuals can be noted
            - Counterbalancing mixes up conditions as to eliminate possible problems from exposure to multiple conditions (predictability, boredom, fatigue, etc.)

<u>Experimental vs. Descriptive/Correlational</u>

- Experimental – researcher manipulates one or more independent variables, measures effect on dependent variables
  Descriptive/Correlational – all variables measured
- Experimental – often occurs in laboratory
  Descriptive/Correlational – typically conducted in natural setting
- Experimental – researcher is able to keep extraneous factors constant

<u>Threats to the Validity of Research</u>

- Internal validity – the degree to which an experiment supports clear causal conclusions (if experiment is well-designed and properly conducted)
- **Confounding of Variables** – two variables are intertwined in such a way that we cannot determine which one has influenced a dependent variable (music does not affect ability to do a test, but mood resulting from music does)
- **Demand Characteristics** – cues that participants pick up about the hypothesis of a study or about how they are supposed to behave
- **Placebo Effects** – decrease internal validity by providing an alternative explanation as to why responses change after exposure to an independent variable (patients improving after psychotherapy may be a result of the therapy itself, or the placebo effect: the expectation to improve afterwards)
- **Experimenter Expectancy Effects** – subtle and unintentional ways in which experimenters influence their participants to respond in a manner that is consistent with the hypothesis
    - Double-blind procedure – participant and experimenter are kept blind as to which experiment condition the participant is in (both patient and doctor are unaware of whether patient received drug or placebo)
- **Replicating and Generalizing the Findings**
    - External validity – the degree to which the results of a study can be generalized to other people, settings, and conditions
    - Replication – the process of repeating a study to determine whether the original findings can be duplicated
        - Problem lies in whether or not experiment is replicated identically

Chapter 3 – Biological Foundations of Behaviour

Neurons

- Basic building blocks of the nervous system
- 100 billion at birth, lose 10,000 every day
- Three main parts:
    - Cell body or Soma
        - Contains biochemical structures needed to keep the neuron alive
        - Nucleus carries genetic information that determines how the cell develops and functions
    - Dendrites
        - Branch-like fibres that emerge from the cell body
        - Collect messages from neighboring neurons and send them to cell body
    - Axon
        - Extends from cell body, conducting electrical impulses to other neurons, muscles, or glands
        - Branches out to form axon terminals
        - Connect with dendritic branches from numerous neurons
- Glial cells surround neurons and hold them in place
    - Also manufacture nutrients, form myelin sheath, absorb toxins and waste
    - Guide newly divided neurons to place in brain during development
- Blood-brain barrier prevents substances from entering brain

Nerve Conduction

- Neurons surrounded by salty liquid environment
    - High concentration of sodium (Na+)
    - Inside of neuron is more negative, causing it to be more electrically negative
    - Resting potential across the membrane: -70 mV
- Action potential (nerve impulse) is a sudden reversal in neuron's membrane voltage
    - Depolarization - changes from –70 mV to +40 mV
    - Graded potentials – changes proportional to the amount of incoming stimulation
        - If potentials aren't very strong, the neuron will be partially depolarized, but not enough for action potential
        - If strong enough, graded potential reaches action potential threshold – about –55 mV (obeys all-or-none law)
    - Graded potentials changes membrane potential by acting on tiny protein structures in the cell membrane called ion channels
        - Open channels allow rushing in of Na+, making neuron less negative
        - Creates state of partial depolarization that may reach action potential
    - When membrane reaches action potential threshold, Na+ rushes in due to attraction to negative force in cell
        - Ion channels close quickly, K+ channels open and K+ leaves cell
        - Restores neuron to resting potential
        - Na+ and K+ flow back to respective positions to restore distribution
    - Refractory period – time period during which the membrane is not excitable and cannot discharge another action potential
        - Occurs immediately after impulse passes
        - Limits rate at which action potentials can be triggered (300 impulses per second in human)
    - Rate of firing or number of neurons fired help differentiate between strength of stimuli
- Myelin sheath is a fatty, whitish insulation layer derived from glial cells that covers axons
    - Thins out at regular intervals, by nodes of Ranvier
    - Allow for high conduction speeds along axon (still slower than speed of electricity in electrical wire)

Synaptic Transmission

- Otto Loewi discovered that neurons release chemicals to pass over to next neuron
- Researchers found synaptic cleft between axon terminals of one neuron and dendrite of the next
- Neurons produce neurotransmitters to carry messages across synapse to excite or inhibit other neurons
    - Process involves five steps:
        - Synthesis – chemical molecules formed inside neuron
        - Storage – molecules stored in synaptic vesicles
        - Release – Action potential causes vesicle to move to surface of terminal, molecules are released into fluid-filled space
        - Binding – molecules cross the space and bind to receptor sites (large protein molecules embedded in the membrane)
        - Deactivation
    - Binding of neurotransmitters to receptor site causes two possible effects:
        - Excitation – depolarizes the postsynaptic cell membrane by stimulating flow of Na+ (excitatory transmitters)
        - Inhibition – hyperpolarizes the postsynaptic cell membrane by stimulating ion channels that allow K+ to flow out of the neuron, or negatively charged ions to flow in (changes potential from –70 mV to –72 mV)
            - Makes it more difficult for excitatory transmitters at other receptor site to depolarize the neuron to the threshold
    - Neurotransmitters continue to function until deactivation:
        - Some deactivated by other chemicals in synaptic space that break them down
        - Reuptake – transmitters reabsorbed into presynaptic axon terminal
    - Examples of neurotransmitters:
        - Acetylcholine (Ach) – functions in excitatory and inhibitory systems (related to memory, motor, behavioural inhibition)
        - Norepinephrine (NE) – functions in excitatory and inhibitory systems (related to arousal, eating)
        - Dopamine (DA) – functions in inhibitory, sometimes excitatory, systems (related to arousal, voluntary movement)
        - Seratonin (5-HT) – functions in inhibitory and excitatory systems (related to sleep, thermoregulation)
        - Gamma Aminobutyric Acid (GABA) – functions in inhibitory systems (related to motor behaviour)
    - Drugs function by affecting neurotransmitters
        - Increase or decreases amount of transmitter, stimulates or blocks receptor sites, terminates transmitter function
        - Examples:
            - Cocaine – stimulates release of dopamine, prevents reuptake
            - Curare – blocks receptor sites for ACh, causes complete paralysis
            - Black widow venom – stimulates release of ACh
            - Botulism toxin – Blocks release of ACh
            - Nicotine – stimulates receptor molecules, “duplicating” effects of ACh
            - Caffeine – blocks adenosine receptor sites
    - Disinhibition – inhibition of inhibitory neurons to bring system back to normal state

The Nervous System

- Three major types of neurons the carry out functions:
    - Sensory neurons – carry input messages from the sense organ to the spinal cord and brain
    - Motor neurons – transmit output impulses from the brain and spinal cord to the muscles and organs
    - Interneurons – link input and output function, perform connective or associative functions with the nervous system
        - Allow connection with mental functions, emotion, and behavioural capabilities

- **Peripheral Nervous System** – contains all neural structures that lie outside of the brain and spinal cord
    - Neurons help carry input and output functions to sense and respond to stimuli
    - Two major division of nervous system:
        - Somatic nervous system – consists of sensory neurons that transmit messages from sensory receptors (eyes, ears, etc.) and motor neurons that send messages from the brain and spinal cord to muscles controlling voluntary movements
        - Autonomic nervous system – controls glands and smooth (involuntary) muscles (heart, blood vessels, etc.)
            - Concerned with involuntary functions (respiration, circulation, digestion, etc.)
            - Two subdivisions:
                - Sympathetic nervous system – activation or arousal function (causes increased heart rate, dilated pupils during stress)
                - Parasympathetic nervous system – slows down body processes and maintains state of tranquility
            - Homeostatis – balanced state achieved by equilibrium among two divisions
- **Central Nervous System** – contains the brain and spinal cord, which connects most parts of the peripheral nervous system with the brain
    - Spinal cord's neurons are protected by the vertebrate
        - Spinal reflexes allow stimulus responses triggered without involvement of the brain
    - Brain is comprised of protein, fat, and fluid
- Various methods for studying brain structure and activity:
    - Neuropsychological tests – measure verbal and non-verbal behaviours that are known to be affected by particular types of brain damage
    - Destructive and Stimulation techniques – controlled damage allows researchers to observe consequences
        - Electrical stimulation can allow for similar observations
    - Electrical recording – electrodes can record brain activity (electroencephalogram (EEG) perform this)
    - Brain imaging:
        - Computerized axial tomography (CT scans) use x-ray imaging to study structures
        - Positron emission tomography (PET scans) measure brain activity
        - Magnetic resonance imaging (MRI) combine scans, creating an image based on how atoms in living tissue respond to a magnetic pulse delivered by the device

<u>The Brain: Structures and Behavioural Functions</u>

- Hindbrain – comprised of brain stem and cerebellum
    - **Brain stem**
        - **Medulla** plays important role in vital body functions such as heart rate and respiration
            - Allows functions to occur automatically
            - Two-way stem for sensory and motor tracts coming from spinal cord and descending from brain
        - **Pons** serves as bridge carrying nerve impulses between higher and lower levels of nervous system
            - Also helps control vital functions
    - **Cerebellum**
        - Looks like little brain attached to rear of brain stem
        - Concerned primarily with muscular movement coordination (also plays role in learning and memory)

        - Timing and coordination of motor movements depend on cerebellum (but are initiated in higher brain centres)
- Midbrain – comprised of clusters of sensory and motor neurons, as well as tracts that connect higher and lower portions of nervous system
    - **Reticular formation**
        - Acts as a sentry, alerting higher centres of brain that messages are coming, and either blocking or allowing them through
        - Without reticular stimulation of higher brain regions, sensory messages do not process despite the impulse reaching the destination
        - Affects sleep, wakefulness, and attention
- Forebrain – comprised of two large cerebral hemispheres that wrap around the brain stem
    - Outer portion is covered by the cortex
    - **Thalamus**
        - Important sensory relay station
        - Organizes inputs from sense organs and routes them to appropriate brain area
    - **Basal Ganglia**
        - Critical for voluntary motor control
        - Plays important role in the deliberate and voluntary control of movement
    - **Hypothalamus**
        - Plays a major role in controlling many different basic biological drives (sexual behaviour, temperature regulation, eating, drinking, aggression, etc.)
    - **Limbic System**
        - Helps coordinate behaviours needed to satisfy motivational and emotional urges that arise in the hypothalamus
            - Hippocampus – involved in forming and retrieving memories
            - Amygdala – organizes emotional response patterns
                - Can produce emotional response without higher regions of brain realizing
- Cerebral Cortex – thick sheet of grey cells that form the outermost layer of the brain
    - Divided into four lobes: frontal, parietal, occipital, temporal **FPOT**
        - Each lobe is associated with particular sensory and motor functions
    - **Motor Cortex**
        - Controls muscles involved in voluntary body movements
        - Amount of cortex devoted to each body part depends on complexity of movements of that part
    - **Sensory Cortex**
        - Somatic sensory cortex receives sensory input that allows for sensations as well as senses of balance and body movement
        - Amount of cortex devoted is dependant on sensitivity of part
        - Body structures lie along side those of motor cortex
    - Speech comprehension and production
        - **Wernicke's area**
            - Involved in language comprehension
        - **Broca's area**
            - Necessary for normal speech production
    - **Association Cortex**
        - Found within all lobes of cerebral cortex
        - Involved in highest level of mental functions
    - **Frontal Lobes**
        - Includes Broca's speech production area, motor cortex, and associative cortex
        - Also involved in emotional experience
        - Prefrontal cortex – region responsible for mental abilities allowing people to direct behaviour in an adaptive fashion

Hemispheric Lateralization

- Corpus callosum is a neural bridge that acts as communication link between two hemispheres
- Lateralization – relatively greater localization of a function in one hemisphere or the other
    - For most people, left hemisphere involved in verbal abilities, speech, mathematical, and logical abilities
    - Right hemisphere involved in mental imagery, musical/artistic abilities, and ability to perceive and understand spatial relationships
    - Left: positive emotions, Right: negative emotions
- If corpus collosum is cut, visual input to one hemisphere is restricted by projecting stimulus to only one side of visual field

Plasticity in the Brain

- Neural plasticity – the ability of neurons to change in structure and function
- Early experiences during brain development can alter brain areas involved in certain skills
- Greater amount of synapses in children allow for greater chance of recovery from damage to brain
    - Adults can also maintain or recover functions by surviving neurons that modify themselves (extended axons, increased neurotransmitters, etc.)

Chapter 4 – Genes, Evolution, and Behaviour

Behaviour Genetics Techniques

- Heritability coefficient – extent to which the degree of variation in a particular characteristic among a group of people can be attributed to genetic factors
- Concordance – the likelihood that two people share a particular characteristic
- Adoption study – study of children who were adopted by comparing to both sets of parents
    - More similar to biological: genetic influence
    - More similar to adoptive: environmental influence
- Adoptive and twin studies have shown that many psychological characteristics have a notable genetic contribution

Genetic Influence on Behaviour

- Intelligence based largely on genetics, but also influenced by environment
    - Identical twins raised together have higher correlation on IQ scores than identical twins raised apart
- Reaction range – range of possibilities (upper and lower limits) that the genetic code allows for a genetically influenced trait
    - Environmental effects determine where individual falls within the boundaries
- Ideal method approach to observe genetics and personality would be to observe personality traits in identical and fraternal twins who were reared together or apart
    - Would allow division of total variation among individuals on personality traits into three components:
        - Variation attributable to genetic factors
        - Variation due to a shared family environment among those reared together
        - Variation attributable to other factors, such as unique individual experiences
    - Studies have shown that identical twins are far more similar in personality than fraternal twins, even if reared apart

Evolution and Behaviour

- Evolution – change over time in the frequency with which particular genes occur within a population
    - Genetic variation can arise through mutations
- Natural selection – characteristics that increase the likelihood of survival and ability to reproduce within a particular environment will be more likely to be preserved in the population, and become more common over time
- Adaptations – allow organisms to meet recurring environmental challenges to their survival, thereby increasing their reproductive ability
    - Domain-specific adaptations – adaptations designed to solve a particular problem

Evolutionary Psychology

- Evolutionary personality theory – traits exist universally in humans because they have helped humans achieve the goals of physical survival and reproduction
- Mating Systems and Parental Investment
    - Parental investment – time, effort, energy, and risk associated with caring successfully for each offspring
        - Many animals ensure survival of next generations by having many offspring, few of which survive
        - Others have few offspring, but care and protect for them
    - Robert Trivers notes that the parent who invests most in offspring will be more competed for and will discriminate more when choosing
        - Monogamous mating system is expected when both parents investment is high, since it is unlikely that a single parent can successfully raise offspring
        - Polyandry (female mates with many males) is rare

        - Polygynandry (all members mate with all other members) is common in some primates, and helps reduce competition
- Cooperation – situations in which one individual helps another to gain an advantage themselves
- Altruism – one individual helps another, but in doing so they accrue a cost
    - Kin selection theory – altruism developed to increase the survival of relatives
    - Theory of reciprocal altruism – altruism is long-term cooperation (expects to receive favor back later)
- Aggression may have evolved as a means to protect offspring, mate, territory, or food

Chapter 5 – Sensation and Perception

- Sensation – the stimulus-detection process by which our sense organs respond to and translate environmental stimuli into nerve impulses that are sent to the brain
- Perception – active process of organizing the stimulus input and giving it meaning

Sensory Processes

- Stimulus detection – absolute threshold designated as the lowest intensity at which a stimulus can be detected 50% of the time
- Signal detection theory – concerned with the factors that influence sensory judgments
    - Decision criterion – standard of how certain a person must be that a stimulus is present before they will say they detect it
    - Increased rewards for noticing stimuli often results in lower detection thresholds
    - Increased danger/punishment for noticing stimuli often raises detection threshold
- Difference threshold – smallest difference between two stimuli that can be perceived 50% of the time (just noticeable difference – jnd)
    - Weber's Law – to perceive a difference between two stimuli, one must differ by a constant ratio
        - Value for weights = 1/50, therefore if 50 lbs. is lifted, increased weight will only be detected at 51 lbs.
        - Smaller fraction = higher sensitivity
        - Doesn't apply to extremely high or low stimulation intensities
- Sensory adaptation – the diminishing sensitivity to an unchanging stimulus
    - Perception of stimuli will decrease if constantly present

The Sensory Systems

Vision

- The Human Eye
    - Light enters eye through cornea (transparent protective structure)
    - Pupil – adjustable opening that dilates or constricts to control amount of light entering
    - Iris – controls the pupil
    - Lens – elastic structure that becomes thinner to focus on distant objects and thicker to focus on nearby objects
        - Image flipped and reversed onto retina
        - Ability to see clearly depends on lens' ability to focus image onto retina
            - Myopia (nearsightedness) – lens focuses image in front of retina
            - Hyperopia (farsightedness) – lens focuses image behind retina
    - Retina – multi-layered tissue at rear of eyeball
- Photoreceptors: Rods and Cones
    - Retina covered in light-sensitive receptor cells
    - Rods – black and white receptors
        - Function best in dim light
    - Cones – color receptors
        - Function best in bright light
    - In humans, rods are everywhere except fovea (direct center of retina)
        - Cones decrease in concentration distant from the fovea
    - Rods and cones send message to brain via two additional layers of cells
        - Bipolar cells have synaptic connections with rods and cones
        - Bipolar cells synapse with ganglion cells, whose axons form into optic nerve
    - Cones in the fovea each have private line to a single bipolar cell (unlike others, which have many rods/cones for each bipolar cell)
        - Visual acuity (ability to see fine detail) increases with image directly on fovea
    - Blind spot exists at point where ganglion cells exit to form optic nerve
- Transduction - process where characteristics of a stimulus are converted into nerve impulses

    - Rods and cones accomplish transduction through photopigments
    - Absorption of light by photopigments increases release of neurotransmitters
- Brightness Vision and Dark Adaptation
    - Dark adaptation – the progressive improvement in brightness sensitivity that occurs over time in low illumination
        - Cones adapt completely in 10 minutes
        - Rods continue adapting for 30 minutes, allowing extreme sensitivity to light
- Color vision
    - Trichromatic theory – three types of color receptors in retina (blue, green, red)
        - All colors produced by combination of wavelengths between these three colors
        - Flaws in theory:
            - Yellow produced by red and green, yet people with red-green color blindness can see yellow
            - Color afterimage (image in different color appears after stimulus shown for a while then withdrawn)
    - Opponent-process theory – three color receptors, each responding to two different wavelengths (red-green, blue-yellow, black-white)
        - Explains color afterimage issue
    - Dual processes in color transduction
        - Modern dual-process theory combines both theories to account for color transduction process
        - Cones contain one of three different photopigments that are sensitive to blue, green, and red
            - Different combinations of intensities will produce different colors
        - Opponent processes occur, but not in cones
            - Ganglion cells respond in opponent-process by altering firing rate
    - Color-deficient vision
        - Dichromat – color blind to only one system (red-green or yellow-blue)
        - Monochromat – completely colorblind (only sees black-white)
- Analysis and Reconstruction of Visual Scenes
    - Feature detectors
        - Optic nerve sends nerve impulses to brain (thalamus, then primary visual cortex)
        - Groups of neurons in the cortex are organized to receive and integrate sensory nerve impulses from specific regions of retina
        - Feature detector cells fire selectively to stimuli that have specific characteristics
            - Certain cells fire when horizontal line present, others when other angles present
            - Parallel processing – different cells analyze stimuli and construct unified image of its properties
    - Visual association processes
        - Information analyzed and reconstructed in primary visual cortex is routed to other regions known as visual association cortex

<u>Audition</u>

- Frequency – number of sound waves or cycles per second (Hz = one cycle per second)
- Amplitude – vertical size of the sound waves (decibels – db)
- Transduction system of ear is made up of bones, membranes, and tubes
    - Sound waves vibrate eardrum, which vibrates three bones (hammer, anvil, and stirrup)
        - Amplify sound waves more than thirty times
    - Cochlea – coiled, snail shaped tube that contain basilar membrane (sheet of tissue)
    - Organ of Corti rests on the basilar membrane
        - Has thousands of tiny hair cells that are actual sound receptors
        - Sound waves cause waves in liquid, which bend hairs, causing release of neurotransmitters

- Sound localization – ability to notice location of sound due to timing difference in sound wave reception in ear
- Two types of hearing loss:
    - Conduction deafness – problems involving the mechanical system that transmits sound waves to the cochlea
    - Nerve deafness – caused by damaged receptors within the inner ear, or damage to the auditory nerve

Taste and Smell: The Chemical Senses

- Taste (gustation) and smell (olfaction) are sensitive to chemical molecules rather than energy
- Taste buds – chemical receptors along edges and back surface of tongue
    - Consists of bitter, sour, salty, and sweet receptors
- Receptors of smell are long cells that project through the lining of the upper part of the nasal cavity and the mucous membrane
- Pheromes – chemical signals found in natural body scents
    - Menstrual synchrony – tendency of women who live together to have similar menstrual cycles

The Skin and Body Senses

- Receptors in skin and internal organs sense pressure, pain, warmth, and cold
    - Mixtures form other sensations, such as itch
- Kinesthesis – provides us with feedback about our muscles' and joints' positions and movements
    - Cooperates with the vestibular sense (sense of body orientation or equilibrium)

Perception: The Creation of Experience

- Two different types of processing functions:
    - Bottom up processing – takes individual elements of the stimulus and combines into a unified perception
    - Top down processing – sensory information is interpreted in the light of existing knowledge, concepts, ideas, and expectations
        - Accounts for psychological influences on perception

Role of Attention in Perception

- Attention involves processes of (1) focusing on certain stimuli, and (2) filtering out other incoming information
    - Studied through technique called shadowing
        - Participants hear two messages simultaneously through earphones, and must repeat one of the messages word for word
        - Most can complete this, but cannot repeat second message
- Attention strongly influenced by nature and personal factors
    - Internal factors (motives and interests) influence which stimuli are noticed

Perceptions Have Organization and Structure

- Synthesia – stimuli in one sensory modality give rise to perceptions in other modalities
- Gestalt theorists believe strongly in top-down processing
    - Wholes perceived are often more than the sum of their parts
    - Figure ground relations – perceptual organization in which a focal stimulus is perceived as a figure against a background of other stimuli
    - Gestalt laws of perceptual organization – four ways in which people group and interpret stimuli
        - Similarity – when parts of a perception are perceived as similar, they will be perceived as belonging together
        - Proximity – elements that are near one another are likely to be perceived as part of the same configuration
        - Closure – people tend to close the open edges of a figure or fill in gaps of an incomplete figure, so that their identification of the form is more complete

        - Continuity – people link individual elements together so that they form a continuous line or pattern that makes sense

Perception Involve Hypothesis Testing

- Perceptual schema – a mental representation or image of a stimulus to compare it with
- Perception is an attempt to make sense of stimulus input, finding the best interpretation of sensory information that can be arrived at based on our knowledge and experience

Perception is Influenced by Expectations

- Perceptual set – a readiness to perceive a stimulus in a particular way based on expectations, motives, emotions, or beliefs

Stimuli are Recognizable Under Changing Conditions

- Perceptual constancies – ability to recognize stimulus characteristics under varying conditions
    - Example – ability to recognize both an open door and closed door as still being a door
    - Shape constancy allows the recognition of people and objects from many different angles
    - Brightness constancy causes the relative brightness of objects remains the same under different conditions of illumination

Perception of Depth, Distance, and Movement

- Brain translates information from retina (only in two dimensions – length and width) into three-dimensional perceptions using two cues:
    - Monocular depth cues – require only one eye
        - Use of light and shadow to create 3D image
        - Linear perception allows depth cues (two lines converging into the difference)
        - Interposition, height, clarity, and relative size also contribute
    - Binocular disparity – require both eyes
        - Perceptions from both eyes are combined into one image (example – 3D glasses)
        - Convergence – produced by feedback from muscles that turn eyes inward to view a near object

Perception of Movement

- Primary cue for perceiving motion is movement of stimulus across the retina
- Relative movement of an object against a structured background is a movement cue
- Stroboscopic movement – illusory movement produced when a light is briefly flashed in darkness, and then, a few milliseconds later, another is flashed nearby
    - Light appears to move, though it is simply quick flashing of light in a movement pattern

Illusions

- Compelling but incorrect perceptions that can be understood as erroneous perceptual hypotheses about the nature of the stimulus
- Size constancy may be distorted to create an illusion of distance

Chapter 6 – States of Consciousness

- Consciousness – our moment to moment awareness of ourselves and our environment
    - Has various characteristics:
        - Subjective and Private – reality and experience depend on the individual
        - Dynamic – consciousness experiences are ever-changing and a continuous flow of mental activity
        - Self-reflective and Central to Our Sense of Self – mind is aware of its own consciousness

Levels of Consciousness

- Freud proposed that the mind consists of three levels:
    - Conscious – contains thoughts, perceptions, and other mental events that we are aware of
    - Preconscious – outside of current awareness, but can be recalled under certain conditions (eg. Reminder is necessary)
    - Unconscious – cannot be brought into conscious awareness under ordinary circumstances (as it would arouse anxiety, guilt, or other negative emotions)
- The Cognitive Unconscious
    - Reject notion of an unconscious mind driven by instinctive urges and repressed conflicts
    - View conscious mental life as complementary forms of information processing
    - Controlled vs. Automatic Processing
        - Controlled – voluntary use of attention and conscious effort (studying, planning, etc.)
        - Automatic – performed with little or no conscious effort (driving, etc.)
    - Divided Attention – ability to perform more than one activity at the same time
        - More difficult when tasks require similar mental resources
- The Emotional Unconscious
    - Emotional and motivational processes also operate unconsciously and influence behaviour
- The Modular Mind
    - Many models propose that the mind is a collection of largely separate but interacting modules
    - Information processing subsystems that perform tasks related to sensation, perception, memory, problem solving, etc.
    - Subjective experience of consciousness arises from the integrated activity of the various modules

Circadian Rhythms: Our Daily Biological Clocks

- Circadian rhythms – daily biological cycles within the body that occur on a 24 hour cycle
- Most rhythms regulated by brain's suprachiasmatic nuclei (SCN) in the hypothalamus
    - Linked to pineal gland, which secretes melatonin (relaxing hormone) at night when SCN is less active to reduce secretion
- Gradual and sudden environmental changes can disrupt our circadian rhythms
    - Seasonal affective disorder – cyclic tendency to become psychologically depressed during certain months of the year
    - Jet lag caused by change in typical daily time cycle

Sleep and Dreaming

- Brain's electrical activity mostly beta waves (high frequency, low amplitude) while awake
- Alpha waves (lower frequency, slightly higher amplitude) while relaxed and drowsy

Stages of Sleep

- Stages 1 through 4
    - Stage 1 – alpha waves turn into theta waves

        - Lasts a few minutes, can be easily awakened
    - Stage 2 – sleep spindles in brain-wave activity indicate transition to stage
    - Stage 3 – regular appearance of slow and large delta waves
    - Stage 4 – delta waves dominate brain wave activity
- Within 60-90 minutes of falling asleep, stages proceed through 1-2-3-4-3-2
- REM sleep – periods of sleep involving rapid eye movements
    - Periods of REM comes following stage 2 sleep
    - Period where dream occurs
        - Dreams can occur during non-REM sleep, but not as vivid
    - REM sleep paralysis – brain sends signals to make voluntary muscle movements more difficult
        - Body is highly aroused, but little or no muscle movement

<u>How Much Do We Sleep</u>

- Newborns began by sleeping 16 hours a day, almost half in REM
- As people age, three important changes occur:
    - Sleep less (19-30 year olds: 8 hours average, elderly: under 6 hours average)
    - REM sleep dramatically decreases during early childhood, but remains stable afterwards
    - Time spent in stages 3 and 4 decline
- Both genetics and environment can affect length of sleep
- Sleep deprivation causes negative impact on functioning, mood, cognition, and physical performance

<u>Why Do We Sleep</u>

- Restoration model – sleep recharges our run-down bodies and allows us to recover from physical and mental fatigue
    - Researchers believe adenosine (decreases alertness, promotes sleep) may play a role in why we sleep
- Evolutionary/circadian sleep models – sleep's main purpose is to increase a species' chances of survival in relation to its environmental demands
    - Those who left shelter at night would be killed by nighttime predators
    - Circadian pattern developed as adaptation to environment
- REM sleep is vital for mental functioning
    - Memory consolidation – ability to transform short-term memory into long-term memory
        - REM may strengthen neural circuits required for this process

<u>Sleep Disorders</u>

- Insomnia – chronic difficulty in falling asleep, staying asleep, or experiencing restful sleep
    - Most common sleep disorder
    - Caused by genetics, medical conditions, mental disorders, drugs, stress, poor lifestyle, and circadian disruptions
- Narcolepsy – extreme daytime sleepiness and sudden, uncontrollable sleep attacks that may last from one minute to one hour
    - Narcoleptics may go right into REM sleep
- REM Sleep Behaviour Disorder – loss of muscle tone that causes normal REM sleep paralysis is absent
- Sleep Apnea – disorder characterized by a repeated cycle in which the sleeper stops breathing, momentarily awakens, and then returns to sleep
    - Caused by an obstruction in the upper airways
- Sleepwalking – typically occurs during stage 3 or 4 sleep
- Nightmares – frightening dreams that occur often during REM sleep in the hours prior to awakening
- Night Terrors – sleeper suddenly sits up and screams
    - No recollection of the episode in the morning
    - Most common during stage 3 or 4 sleep

The Nature of Dreams

- Dreams most common when brain is most active (brain activity highest during REM sleep, and during final hours of sleep)
- **Freud's psychoanalytic theory**
    - Main purpose of dreaming is wish fulfillment (gratification of unconscious desires and needs)
        - Desires are too unacceptable to be consciously acknowledged and fulfilled in real life
    - Manifest content – story the dreamer reports
    - Latent content – the disguised psychological meaning
    - Dream work is the process by which the latent content is transformed into the manifest content
- **Activation-synthesis theory**
    - During REM sleep, the brain bombards higher brain centers with random neural activity (activation)
    - Cortex attempts to interpret activity by creating a best fit to the pattern of activation (synthesis)
    - Accounts for the bizarreness of dreams
- **Cognitive approaches**
    - Problem-solving dream models – dreams can help us find creative solutions to our problems and conflicts because they aren't constrained by reality
    - Cognitive-process dream theories – focus on the process of how we dream
        - Propose that dreaming and waking thought are produced by same brain systems
        - Dreaming requires imagery skills and other cognitive abilities that young children have not yet developed
            - Explains why ability to dream develops with age
        - Similar activity between dreaming and waking mental activity
            - Rapid content shifts due to change of thought

Daydreams and Waking Fantasies

- Involved greater visual imagery than other forms of waking mental activity
- Less vivid, emotional, and bizarre than nighttime dreams

Drugs and Altered Consciousness

Drugs and the Brain

- Drugs can pass through the blood-brain barrier and alter consciousness by facilitating or inhibiting synaptic transmission
- Agonist – drug that increases that activity of a neurotransmitter
    - Activates receptor, enhances production/storage/release, prevents reuptake.
    - Examples:
        - Opiates (pain relievers) – activate endorphin receptors
        - Amphetamines (stimulants) – enhance production and prevent reuptake of dopamine and norepinephrine
- Antagonist – drug that inhibits or decreases the activity of neurotransmitters
    - Many bind to receptors, but do not affect neuron

Tolerance and Withdrawal

- Tolerance – the decreasing responsivity to a drug
    - Larger doses required to reach same effects
    - Stems from body's attempt to maintain a state of optimal physiological balance (homeostasis)
    - Brain produces compensatory reactions to oppose effects of drug (e.g. decrease heart rate)

- Withdrawal – occurrence of compensatory responses after drug use is discontinued, causing the person to experience physiological reactions opposite to those that had been produced by the drug

Learning, Drug Tolerance, and Overdose

- Tolerance for drugs partly depends on the familiarity of the drug setting
    - Continued drug use in same setting causes progressively stronger compensatory responses, increasing the tolerance
    - Classically conditions drug users to have compensatory responses while in drug setting, causing withdrawal, and increasing craving for drug
- If drug user takes typical high dose in unfamiliar setting, compensatory responses don't respond as strongly leads to overdose

Facts about Drug Addiction and Dependence

- Drug tolerance does not always lead to significant withdrawal at typical doses
- Substance dependence can occur even without tolerance or withdrawal
- Physiological dependence is not the major cause of drug addiction

Depressants

- Decrease nervous system activity
- Alcohol – most widely used recreational drug in numerous countries
    - Increases activity of gamma-aminobutyric acid (GABA)
    - Alcohol myopia – shortsightedness in thinking caused by inability to pay attention
- Barbiturates (sleeping pills) and Tranquilizers (anti-anxiety drugs) – used as sedatives and relaxants
    - Depress the nervous system by increasing activity of inhibitory neurotransmitters

Stimulants

- Increase neural firing and arouse the nervous system
- Amphetamines – increase dopamine and norepinephrine activity
    - Amphetamine psychosis – schizophrenia-like hallucinations and delusions that occur when the brain's dopamine activity is artificially increased far beyond normal levels by heavy amphetamine use
    - Ecstasy primarily alters serotonin functioning by causing release and blocking reuptake of it
- Cocaine – increases activity of norepinephrine and dopamine by blocking reuptake

Other Drugs

- Opiates (morphine, codeine, heroin) are drugs derived from opium
    - Bind to and stimulate receptors normally activated by endorphins
    - Relieve pain and cause intense euphoria
- Hallucinogens (LSD) – powerful mind altering drugs that produce hallucinations
- Marijuana – THC binds to receptors on neurons throughout the brain

Hypnosis

- Hypnosis – state of heightened suggestibility in which some people are able to experience imagined test suggestions as if they were real
- Hypnotic induction – process by which one person leads another person into hypnosis

Hypnotic Behaviours and Experiences

- Involuntary Control and Behaving against One's Will
    - Behaviour seems involuntary
    - Studies show that those pretending to be hypnotized will commit same actions that those truly hypnotized will
- Physiological Effects and Physical Feats

    - Hypnotized people with allergies can be exposed to certain allergens and, if told that it is harmless, most will not have an allergy
    - Can also be seen without hypnosis
- Pain Tolerance
    - Hypnosis can act as an anesthetic, producing analgesia (an absence of pain)
- Hypnosis and Memory
    - Hypnotic amnesia can be temporarily produced

Theories of Hypnosis

- Dissociation Theories
    - Hypnosis viewed as an altered state involving a division of consciousness
    - Person simultaneously experiences two streams of consciousness that are cut off from one another:
        - One stream responds to hypnotist's questions
        - Second stream (part of consciousness that monitors behaviour) remains in the background but is aware of everything
- Social Cognitive Theories
    - Hypnotic experiences result from expectations of people who are motivated to take on the role of being hypnotized
    - People motivated to conform to the role of a hypnotized person develop a readiness to respond to the suggestions and to perceive the hypnosis as real and involuntary

Chapter 7 – Learning and Adaptation: Role of Experience

- Learning – process by which experience produces a relatively enduring change in an organism's behaviour or capabilities

Adapting to the Environment

- Behaviourists focus on *how* organisms learn, examining the processes by which the experience influences behaviour
- Ethology focuses on the functions of behaviour
    - Adaptive significance – how behaviour influences an organism's chances for survival
    - Fixed action pattern – unlearned response automatically triggered by a particular stimulus
- Environment shapes behaviour in two fundamental ways:
    - Personal adaptation (behaviorists) – behaviour is influenced by immediate environment and by capabilities that have been acquired through experience
    - Species adaptation (ethology) – genetically based features that enhance a species' ability to adapt to the environment are more likely to be passed on to future generations
- Habituation – decrease in strength of response to repeated stimulus
    - Occurs across nearly all species
    - Allows organisms to conserve energy by not responding to every stimulus in environment
    - Occurs within central nervous system, not within sensory neurons (like sensory adaptation)

Classical Conditioning

- Classical conditioning – learning to associate two stimuli such that one stimulus comes to produce a response that originally was only produced by the other stimulus
- Pavlov discovered that when a stimulus is associated with food, dogs will learn to associate the stimulus with food, and will salivate
    - Before conditioning:
        - Tone No salivation
        - Food (UCS) Salivation (UCR)
    - During conditioning:
        - Tone (CS) + Food (UCS) Salivation (UCR)
    - After conditioning:
        - Tone (CS) Salivation (CR)

Basic principles of classical conditioning

- **Acquisition**
    - Period during which a response is being learned
    - CS is paired with UCS to establish a strong CR
    - Fastest: forward trace pairing (CS appears before UCS)
    - Slower: simultaneous pairing (CS appears with UCS)
    - Slowest: backward pairing (CS appears after UCS)
    - Generally strongest when repeated pairings, intense UCS, and sequence involves forward pairing with a short break between CS and UCS
- **Extinction and Spontaneous Recovery**
    - Extinction - if CS is presented repeatedly without UCS, CR will weaken and disappear
        - Repeated extinction trials will speed up extinction
    - Spontaneous discovery – reappearance of a previously extinguished CR after a rest period, without new learning trials
        - CR from spontaneous recovery is usually weaker
        - Extinction occurs more rapidly
- **Generalization and Discrimination**
    - Stimulus generalization - once CR is acquired, organism will respond to other stimuli that are similar to original CS
        - Greater chance for CR in more similar CS
    - Discrimination – when a CR occurs to one stimulus, but not to others
- **Higher-Order Conditioning**
    - Higher-order conditioning – a neutral stimulus becomes a CS after paired with another CS (rather than the original UCS)
        - Typically, the new CS is weaker and extinguishes sooner

Applications of classical conditioning

- Acquiring and Overcoming Fear
    - Most fears are conditioned
    - Exposure therapy – technique designed to extinguish anxiety responses by exposing clients to anxiety-arousing stimuli or situations, allowing extinction to occur
    - Systematic desensitization – patient learns relaxation techniques and then is gradually exposed to the fear-provoking stimulus
    - Flooding – immediately exposes the person to the phobic stimulus
- Conditioned Attraction and Aversion:
    - Aversion therapy – attempts to condition an aversion to a stimulus that triggers unwanted behaviour by pairing it with a harmful UCS

Operant Conditioning

- Operant conditioning – type of learning in which behaviour is influenced by its consequences
- Law of Effect (Thorndike) – in a given situation, a response followed by an unsatisfying outcome will become less likely to occur
- B. F. Skinner viewed operant conditioning as form of natural selection that facilitates personal adaptation
    - Skinner box – box with lever that, if pulled, drops food into cup
    - Skinner found that rat will press bar more frequently over time
- Several important types of consequences:
    - Reinforcement – response is strengthened by an outcome that follows it
        - Caused by reinforcer (such as food)
    - Punishment – response is weakened by an outcome that follows it
        - Caused by punisher (electric shock)
- Skinner's analysis of operant behaviour involves three events
    - Antecedents – stimuli prevented before behaviour occurs
    - Behaviours – behaviour that the organism emits
    - Consequences – what follows the behaviour
- Discriminative stimulus – signal that a particular response will produce certain consequences (e.g. a light that would signal the rat to pull the lever, but if no light was on, no food would come out)

Consequences

- Positive reinforcement – a response is strengthened by the presentation of a stimulus (positive reinforcer)
    - Primary reinforcer – stimuli that an organism finds reinforcing due to biological needs (e.g. water or food)
    - Secondary/Conditioned reinforcer – stimuli that acquires reinforcing qualities by being associated with a primary reinforcer (e.g. money)
- Negative reinforcement – a response is strengthened by the removal or avoidance of a stimulus (negative reinforcer)
- Operant extinction – the weakening and eventual disappearance of a response because it is no longer reinforced
    - Resistance to extinction notes the degree to which non-reinforced responses persist
- Positive punishment – a response is weakened by the presentation of a stimulus
    - Often produces rapid results
    - Suppression may not generalize to relevant situations
- Negative punishment – a response is weakened by the removal of a stimulus
- Reinforcement or punishment that occurs immediately after behaviour has a stronger effect than when delayed
    - Delay of gratification – the ability to forego an immediate but smaller reward for a delayed by more satisfying outcome

Shaping and Chaining

- Shaping – reinforcing successive approximations toward a final response

    - Example: To get a child to be active when he usually sits and does nothing, first reward him every time he gets up, then only when he walks towards something active, then only once he does something active
- Chaining – reinforcing each response with the opportunity to perform the next response
    - Example" At first the rat learns to press a lever when it sees a light, but after accidentally hitting a bell nearby that turns the light on, the rat will learn to ring the bell

Generalization and Discrimination

- Operant generalization – an operant response occurs to a new stimulus or situation that is similar to the original
- Operant discrimination – an operant response will occur to one stimulus, but not another

Schedules of Reinforcement

- Continuous reinforcement – every response of a particular type is reinforced
- Partial reinforcement – only some responses are reinforced
    - Ratio schedules are based on a certain percentage of reinforced responses
        - Fixed ratio schedule – reinforcement is given after a fixed number of responses (e.g. food after three pulls of lever)
        - Variable ratio schedule – reinforcement is given after a variable number of correct responses, all centered around an average (e.g. slot machine pays on average every 20 pulls)
    - Interval schedules are based on a certain amount of time elapsing between reinforcements
        - Fixed interval schedule – first correct response that occurs after a fixed time interval is reinforced (e.g. food only on first pull of lever every 20 minutes)
        - Variable interval schedule - reinforcement is given for the first response that occurs after a variable time interval (e.g. quizzes about every 2 weeks)
- Partial reinforcement is learned slower, but more resistant to extinction (especially on variable schedule)
    - Takes longer to realize that variably reinforced responses are not occurring

Escape and Avoidance Conditioning

- Escape conditioning – a form of learning in which the organism learns to perform a behaviour in order to escape from an aversive stimulus (e.g. rat will run to other room if floor causes shock)
    - Maintained through negative reinforcement
- Avoidance conditioning – a form of learning in which the organism learns a response to avoid an aversive stimulus (e.g. rat will run to other room if light warns of shock to come)
    - Two factor theory of avoidance learning – classical and operant conditioning are involved
        - Classical: warning light is a neutral stimulus associated with shock (UCS), which turns light into CS causing fear (CR)
        - Operant: fleeing from the light is negatively reinforced by the termination of fear, strengthening the avoidance response
            - Avoidance response prevents extinction from occurring, since rat will never stay long enough to know if shock still occurs

Applications of Operant Conditioning

- Animals can be trained to do various tasks (assist disabled, perform, etc.)
- Applied behaviour analysis – program designed and implemented to change behaviour, and effectiveness is measured before and after

Biology and Learning

- Preparedness – through evolution, animals are biologically prewired to easily learn behaviours related to survival

    - Conditioned taste aversion – learned repulsion to food by virtue of pairing it with an aversive UCS (e.g. nausea, illness, etc.)
    - Humans have tendency to develop certain phobias more easily (e.g. spiders, snakes, dangerous places)
- Instinctive drift – a conditioned response that drifts back towards instinctive behaviour

Cognition and Learning

- Edward Tolman found that if rats were presented a route in a maze that led to a box, and then that route was blocked, but multiple other ones were opened, the rats would choose the path that headed in the direction of the box
    - Not explained by reinforcement theory
    - Cognitive map – mental representation of the spatial layout of an area
    - Learning does not merely stamp in stimulus-response connections, but provides knowledge, from which organisms develop an expectancy (a cognitive representation of "what leads to what")
- Classical conditioning forms a CS-UCS link (expectancy model)
    - Most important factor in classical conditioning is how well the CS predicts (i.e. signals) the appearance of a UCS
        - Not how often the CS and UCS are paired
    - Explains why organisms aren't conditioned to all neutral stimuli that are present prior to a UCS (since they do not consistently predict a UCS)
        - Also explains why forward pairing is most effective
- Organisms develop an awareness or expectancy of relations between their responses and probable consequences
    - Best predictor of behaviour is the perceived contingency, not the actual one
        - Often are identical, but sometimes not (e.g. superstitions)
- Latent learning – learning that occurs but is not demonstrated until there is an incentive to perform
- Observational learning – learning that occurs by observing the behaviour of a model

Chapter 8 – Memory

- Memory – processes that allow us to record and later retrieve experiences and information

Memory as Information Processing

- Encoding – getting information into the system by translating into a neural code that your brain processes
- Storage – retaining information over time
- Retrieval – the process of accessing information in long term memory

Three-Component Model

- Three major components of memory:
    - Sensory memory – holds incoming sensory information just long enough for it to be recognized
        - Composed of sensory registers:
            - Iconic store (visual sensory)
            - Echoic store (auditory sensory) – lasts longer than iconic
    - Short-Term/Working memory – type of memory that holds the information that we are conscious of at any given time
        - Working memory refers to fact that it consciously processes, codes, and works on information
        - Mental representations are how information is coded to be retained in short term memory
            - When reading words, information is stored as phonological codes
        - Short term memory can only hold limited information
            - Most people can hold no more than five to nine meaningful items

        - Chunking – combining individual items into larger units of meaning
        - Maintenance rehearsal – simple repetition of information
        - Elaborative rehearsal – involves focusing on the meaning of information or relating it to other things we already know
    - Three components of working memory (according to Alan Baddeley):
        - Auditory working memory – repetition of information to self
        - Visual spatial working memory – temporary storage and manipulation of images and spatial information
        - Central executive – decides how much attention to allocate to mental imagery and auditory rehearsal
- Long-Term memory – vast library of more durable stored memories
    - Serial position effect – recall of information is influenced by a word's position in a series of items
        - When given a long list of words, the beginning and ending words are most remembered
            - Primacy effect – superior recall of early words
                - At first, brain rehearses beginning words, storing into long term memory
                - List gets longer, and short term memory fills up
            - Recency effect – superior recall of recent words
                - Last words remembered since they aren't bumped out of short term memory by newer words

Encoding: Entering Information

- Effortful processing – encoding that is initiated intentionally and requires conscious attention
- Automatic processing – encoding that occurs without intention and requires minimal attention

Levels of Processing

- Structural encoding – processing based on structure of information
- Phonological encoding – processing based on sound
- Semantic encoding – processing based on meaning
- Levels of processing concept: the more deeply we process information, the better it is remembered
    - Semantic encoding involves most processing, since meaning must be focused on
    - Reason why elaborative rehearsal is more effective than maintenance rehearsal

Organization and Imagery

- Hierarchies and chunking
    - Takes advantage of principle that memory is enhanced by associations between concepts
    - Chunking widens information processing caused by limited capacity of short term memory (e.g. encoding phone number in sets of numbers)
- Mnemonic devices
    - Mnemonic device is any type of memory aid (including hierarchies and chunking)
    - Does not reduce amount of information to encode, but provides extra cues to retrieve information
- Visual imagery
    - Dual coding theory – encoding information using both codes (verbal and nonverbal) enhances memory
        - Odds improve that at least one of the codes will be available
- Schema – an organized pattern of thought about some aspect of the world
    - Create a perpetual set

Storage: Retaining Information

Memory as a Network

- Associative network – a massive network of associated ideas and concepts

    - Priming – activation of one concept by another (e.g. "fire engine" primes the node for "red")
- Neural network – each concept is represented by a particular pattern or set of nodes that becomes activated simultaneously

Types of Long-Term Memory

- Declarative and Procedural memory
    - Declarative – involves factual knowledge, broken into two subcategories:
        - Episodic memory – store of factual knowledge concerning personal experience
        - Semantic memory – general factual knowledge about the world and language, including words and concepts
    - Procedural – memory reflected in skills and actions
        - One component consists of skills involved in "doing things" in particular situations
        - Other component reflects classical conditioning effects
- Explicit and Implicit memory
    - Explicit – involves conscious or intentional memory retrieval
    - Implicit – occurs when memory influences our behaviour without conscious awareness (e.g. riding a bike, driving)

Retrieval: Accessing Information

- Retrieval cue – any stimulus (internal or external) that stimulates the activation of information stored in long-term memory
    - Multiple self-generated cues is most effective way to maximize recall
- Flashbulb memories – recollections that seem so vivid and clear, that they can be pictured as if they were a snapshot of a moment of time
    - Accuracy of these memories fades over time

Context, State, and Mood Effects on Memory

- Encoding specificity principle – memory is enhanced when conditions present during retrieval match those that were present during encoding
- Context dependent memory – phenomenon that it is typically easier to remember something in the same environment in which it was acquired
- State dependent memory – ability to retrieve information is greater when our internal state at the time of retrieval matches the original state during learning
    - Does not extend to mood states
        - Mood congruent recall – tendency to recall information or events that are congruent with our current mood

Forgetting

- Forgetting tends to occur more rapidly at first, then slows down
    - Most of forgotten information occurs right away, then only a little forgotten over rest of time

Why Do We Forget

- Encoding failure – information was never encoded into long term memory
- Decay theory – proposes that with time and disuse, the physical memory trace in the nervous system fades
    - Problem in prediction that longer intervals of disuse cause increased decay of information
        - Reminiscence – phenomenon where more material is recalled during second testing of information than the first
- Two types of interference:
    - Proactive interference – occurs when material learned in the past interferes with recall of new material (e.g. learning a new phone number)
    - Retroactive interference – occurs when newly acquired information interferes with the ability to recall earlier acquired information (e.g. recalling an old phone number)

    - Tip of the tongue phenomenon does not always reflect a retrieval of information problem (sometimes the answer is never known to begin with)
- Motivated forgetting – motivational processes (e.g. repression) may protect us by blocking the recall of anxiety-arousing memories

Amnesia
- Retrograde amnesia – memory loss for events that occurred prior to the onset of amnesia
- Anterograde amnesia – memory loss for events that occur after the initial onset of amnesia
- Infantile amnesia – memory loss for events that occurred during the first few years of our lives
    - Experienced by everyone

Forgetting to do Things
- Prospective memory – concerns remembering to perform an activity in the future
    - People with better retrospective memory don't have better prospective memory

The Misinformation Effect and Eyewitness Testimony
- Misinformation effect – distortion of a memory by misleading post-event information
- Source confusion – tendency to recall something or recognize it as familiar, but to forget where it was encountered

The Biology of Memories

Where in the Brain are Memories Formed?
- Hippocampus and Cerebral Cortex
    - Hippocampus and adjacent tissue help encode and retrieve long term declarative memories
    - Cortex encodes by processing information from sensory registers
    - Memory consolidation – creation and binding together of neural codes that allow information to be transferred from short term memory into long term memory
        - Consolidation in hippocampus allows for many components to become a unified memory
- Thalamus and Amygdala
    - Damage to thalamus can produce amnesia
    - Amygdala encodes emotionally arousing and disturbing aspects of events
        - Damage can disrupt conditioned fear response
- Cerebellum
    - Plays an important role in the formation of procedural memories

Chapter 9 – Thought, Language, and Intelligence

Language

The Nature and Structure of Language

- Language – a system of symbols and rules for combining these symbols in ways that can produce an almost infinite number of possible messages and meanings
    - Three critical properties of language:
        - Symbolic: Uses sounds, written signs, or gestures to refer to objects, events, ideas, and feelings
            - Displacement – capacity of language to represent objects and conditions that aren't physically present
        - Structure: Has rules that govern how symbols can be combined to create meaningful communication units
        - Generative: Symbols can be combined to generate an almost infinite number of messages

Language Structure

- Surface structure – consists of the way symbols are combined within a given language
    - Syntax – the rules for the combination of symbols
- Deep structure – refers to the underlying meaning of the combined symbols
    - Semantics – the rules for connecting the symbols to what they represent
- Example: "Flying planes can be dangerous." (surface)
    - Deep 1: Planes are dangerous
    - Deep 2: Piloting a plan is dangerous
- Noam Chomsky: Transformational grammar
    - Rules transform meaning of the deep structure to sequence of the surface structure
    -

Sentence Phrases Words Morphemes Phonemes

- Phonemes – smallest units of sound recognized as separate in a given language
- Morphemes – smallest units of meaning in a language
    - Include base words, prefixes, suffixes, etc.

Humor

- Various forms of humor based on language:
    - Phonological ambiguity – confusion of sounds
    - Lexical ambiguity – confusion or double meaning of words
    - Syntactic ambiguity – confusion of structure
    - Semantic ambiguity – confusion of meaning
- Children progress from phonological and lexical humor to syntactic and semantic

Acquiring a Language

- **Biological Foundations**
    - Several facts suggest biological basis for language acquisition
        - Human children, despite limited thinking skills, begin to master language at early life without formal instruction
    - Between 1-3 months: infants vocalize entire range of phonemes found in world's languages (cooing)
    - By 2 months, infacts show phoneme discrimination
    - About six months: infants begin to make sounds of their native tongue and to discard those of other languages
    - Linguists believe there exists a critical period between infancy and puberty when language is most easily learned
    - Can children form language without hearing others speak?
        - Wild children – no

        - Isolated children – maybe
        - Lack adult models for language (e.g. deaf kids with parents who don't use sign language) – maybe
            - Can develop signs with rudimentary syntax
        - Other animals - no
    - Sex differences:
        - Men who suffer left hemisphere strokes are more likely than women to show severe aphasic symptoms (disruption in speech comprehension and/or production)
            - Suggests that women may share more language function with right hemisphere
- **Social Learning Processes**
    - Motherese – high pitched intonation used by parents to converse with infants
    - B.F. Skinner developed operant conditioning explanation for language acquisition
        - Children's language development is strongly governed by adults' reinforcing appropriate language and non-reinforcing of inappropriate verbalization
        - Problems:
            - Children learn much too fast
            - Parents typically do not correct grammar as much as "truth value"
    - Telegraphic speech – two word sentences uttered during second year of life that consist of a noun and verb (e.g. "Want cookie")
- **Bilingualism: Learning a Second Language**
    - Learned best and spoken most fluently when learned during critical period of childhood
    - If both languages are learned at early age, they often function in the same brain region

Linguistic Influences on Thinking

- Empiricists – thought is a mental image
- Behaviourists – thought is a motor action
- Linguistic relativity hypothesis – language not only influences, but also determines what we are capable of thinking
    - Multiple studies have disproved the determination part
- Modern view is that language can influence how we think, how efficiently we categorize our experiences, and how much detail we attend to in our daily life experience
- Language also influences how well we think in certain domains
    - English children consistently score lower than Asian children in mathematical skills due to words and symbols used in each language to represent numbers
        - Chinese uses easier system to learn numbers (11 = "ten one")
        - English speakers must use more complex system (11 = "eleven")
- Propositional thought – a form of linguistically based thought that expresses a statement in subject-predicate thought
- Imaginal thought – a form of thinking that uses images that can be from any sense modality
- Motoric thought – mental representations of motor movements

Concepts and Propositions

- Propositions – statements that express facts
    - Consist of concepts combined in a particular way
        - Typically, one concept is a subject, another is a predicate
- Concepts – basic units of semantic memory (mental categories into which we place objects, activities, abstractions, and events that have essential features in common)
- Prototypes – most typical and familiar members of a class that defines a concept
    - Use of prototypes is most elementary method of forming concepts
        - Requires only that we note similarities among objects

Reasoning and Problem Solving

Reasoning

- Two types of reasoning:
  - Deductive reasoning – reasoning from a general principle to a specific case
    - Basis of formal mathematics and logic
    - Viewed as stronger and more valid reasoning because conclusion cannot be false if premises are true
    - Syllogism: If all humans are mortal (first premise), and Socrates is a human (second premise), then Socrates must be mortal (conclusion)
  - Inductive reasoning – reasoning from specific facts to develop a general principle
    - Leads to likelihood rather than certainty
    - New observations may disprove conclusion
- Stumbling Blocks in Reasoning
  - Distraction by irrelevant information – people take into account irrelevant information that leads them astray
  - Failure to apply deductive rules – people think of problem solving methods as to be used only in certain situations and cannot apply to new problems
  - Belief bias – tendency to abandon logical rules in favour of personal beliefs
    - Students claimed conclusion was not correct to following syllogism: All things that are smoked are good for one's health, cigarettes are smoked, therefore cigarettes are good for one's health

Problem Solving

- Four stages of problem solving:
  - Understanding, or framing, the problem – problem must be framed optimally to have chance of generating an effective solution
  - Generating potential solutions – must determine which procedures and explanations will be considered, and which solutions are consistent with evidence
  - Testing the solutions – remaining solutions must be tested and evaluated
    - Mental set – tendency to stick to solutions that have worked in past
      - Can result in less effective problem solving
  - Evaluating results
- Problem solving schemas – step by step scripts for selecting information and solving specialized classes of problems
  - Experts rely on schemas that are developed with experience
  - Development of expertise is accompanied by alterations in brain functioning that increase processing efficiency
- Algorithms and heuristics
  - Algorithms – formulas or procedures that automatically generate correct solutions
  - Heuristics – general problem solving strategies that are applied to certain classes of situations
    - Means end analysis – identify differences between present situation and one's desired state/goal and make changes to reduce differences
    - Subgoal analysis – people can attack a large problem by formulating subgoals or intermediate steps toward a solution
- Uncertainty, heuristics, and decision making
  - Representativeness heuristic – rule of thumb in estimating probability that an object or event belongs to a certain category based on extent to which it represents a prototype of the category
    - Tversky and Kahneman note that people confused representativeness with probability
  - Availability heuristic – rule of thumb used to make likelihood judgments based on how easily examples of that category of events come to mind or are available in memory
    - Example: people were less likely to book flights following September 11th, since the memory of the event is readily accessible

- Confirmation bias – people tend to look for evidence that will confirm what they currently believe rather than look for evidence that could disconfirm their beliefs
- Sternberg and Davidson found that correct solutions to insight problems involve:
    - Selective encoding – choosing what information matters
    - Selective combination – choosing what's important within chosen information
    - Selective comparison – out of chosen information, how does it apply to the problem

Intelligence

- Concept or construct that refers to the ability to acquire knowledge, to think and reason effectively, and to deal adaptively with the environment

Intelligence in Historical Perspective

- Sir Francis Galton
    - Showed through study of family trees that eminence and genius seemed to occur across generations with certain families
    - Exhibited belief bias, and dismissed fact that successful people often came from privileged environments
    - Approach to mental skills measurement fell into disfavour because measures of nervous system efficiency proved unrelated to socially relevant measures of mental ability
- Alfred Binet
    - Developed test to help identify children who require educational help at early age
    - Made two assumptions about intelligence:
        - Mental abilities develop with age
        - Rate at which people gain mental competence is a characteristic of the person and is fairly constant over time
    - Tests would result in score called mental age (age at which a child can solve problems for)
    - William Stern provided a relative score called intelligence quotient
        - IQ = (Mental age / Actual age) x 100
    - Problem is that increases in mental age begin to slow down dramatically around age 16
    - Deviation IQ – modern score that represents how much standardized distance a score is above or below the mean of a particular sample
- The Stanford-Binet and Wechsler Scales
    - Lewis Terman revised Binet's test, creating the Stanford-Binet test
    - David Wechsler developed intelligence tests for adults (WAIS), children (WISC), and preschoolers (WPPSI)
        - Most widely used intelligence tests
        - Consists of series of subtests that fall into verbal tests and performance tests
- Group tests of aptitude and achievement
    - Using written tests for selective purposes highlights an issue Binet faced:
        - Should university applicants be given an achievement test (how much they have learned in high school) or an aptitude test (measure applicant's potential for future learning and performance)?

Scientific Standard for Psychological Tests

- Psychological test – a method for measuring individual differences related to some psychological concept, or construct, based on a sample of relevant behaviour in a scientifically designed and controlled situation
- Reliability – consistency of measurement
    - Test-retest reliability – extent to which scores on a presumably stable characteristic are consistent over time
    - Internal consistency – extent to which an experiment produces clear causal conclusions (will be high when there is no confounding of variables)
    - Interjudge reliability – extent to which different observers or scorers agree in their scoring of a particular test or observed behaviour

- Validity – how well a test actually measures what it is designed to measure
    - Construct validity – extent to which a test measures the psychological construct (e.g. intelligence, anxiety) that it is purported to measure
    - Content validity – extent to which the test items adequately sample the domain that the test is supposed to measure
    - Predictive validity – ability of a test to predict future outcomes that are influenced by the characteristic measured by that test
- Standardization and norms
    - Standardization – refers to (1) creating a standard set of procedures for administering a test or making observations, and (2) deriving norms to which an individual's performance can be compared
    - Norms – test scores derived from a relevant sample used to evaluate individuals' scores
    - Normal distribution of intelligence tests has an average of 100

<u>The Nature of Intelligence</u>

- Two major approaches to studying intelligence:
    - Psychometric: maps the structure of intellect and specifies the kinds of mental ability that underlie test performance
    - Cognitive: studies specific thought processes that underlie mental competencies
- **Psychometric Approach**
    - Psychometrics – statistical study of psychological tests
        - Standardization, reliability, and validity are all psychometric concepts
        - Tries to identify and measure abilities that underlie individual differences in performance on tests
        - Factor analysis – analysis of patterns of correlation between test scores in order to discover clusters of measures that correlate highly with one another but not with measures in other clusters (Example: if four tests were highly correlated with each other, and all required subjects to solve mathematical problems, the underlying factor may be mathematical reasoning ability)
        - Some believe intelligence is a single global mental capacity, while others regard it is a set of specific abilities to do different types of thinking
    - The "g" factor
        - Charles Spearman found that school grades among different subjects were highly correlated, but were not perfect
        - Found also in intelligence tests
        - Concluded that intellectual performance is determined partly by general intelligence ("g") and partly by other special abilities required to perform a particular task
        - Example: performance in a mathematics course would depend mainly on the "g" factor of the individual, but also ability to learn mathematics
    - Intelligence as specific mental abilities
        - L. L. Thurstone concluded that human mental performance depends not on a general factor, but seven distinct abilities, called primary mental abilities (spatial, perceptual speed, numerical, verbal meaning, memory, verbal fluency, and inductive reasoning)
    - Crystallized and fluid intelligence
        - Horn and Cattell divided Spearman's "g" factor into two correlated but distinct abilities
        - Crystallized intelligence – the ability to apply previously acquired knowledge to current problems
            - Depends largely on ability to retrieve information and previously learned problem solving schemas from long term memory
        - Fluid intelligence – the ability to deal with novel problem solving situations for which personal experience does not provide a solution
        - Throughout life, people progress from using fluid intelligence to crystallized intelligence

- Multiple intelligences
  - Howard Gardner advanced a theory of multiple intelligences that define six distinct varieties of intelligence (linguistic, mathematical, visual-spatial, musical, body-kinesthetic, and personal)
  - Bases argument on studies of brain damaged, which leave some abilities devastated, while sparing others
    - Savants – intellectually disabled in a general sense, but exhibit striking skills in specific areas
- Emotional intelligence – the ability to read others' emotions accurately, to respond to them appropriately, to motivate oneself, to be aware of one's own emotions, and to regulate and control one's own emotional responses

- **Cognitive Process Approaches**
  - Cognitive process theories try to explain *why* people vary in intelligence by relating types of individual variation described in the psychometric approach to various cognitive skills
  - Sternberg's triarchic theory – addresses both the psychological processes involved in intelligent behaviour and the diverse forms that intelligence can take
    - Divides the cognitive processes into three classes:
      - Metacomponents – higher order processes used to plan and regulate task performance (include identifying problems, formulating hypotheses and strategies, etc.)
        - Fundamental sources of individual differences in fluid intelligence
      - Performance components – actual mental processes used to perform a task (include perceptual processes, memory retrieval, etc.)
      - Knowledge acquisition components – allow us to learn from experience, store information in memory, and combine new insight with previously acquired information
        - Underlie individual differences in crystallized intelligence
    - Environmental demands may call for three different manifestations of intelligence:
      - Analytical – involves kinds of academically oriented problem solving skills assessed by traditional intelligence tests
      - Practical – refers to skills needed to cope with everyday demands and to manage oneself and other people effectively (includes emotional intelligence)
      - Creative – mental skills needed to deal adaptively with novel problems
  - Galton resurrected
    - Modern attempts to relate neural measures to IQ
    - Electrophysiological studies of brain responses to visual and auditory stimuli have modest correlation
    - Studies of brain metabolism show lower levels of glucose consumption in people of high intelligence
- Brain size and intelligence
  - Studies of Einstein's brain found overall brain size smaller than average
    - However, parietal lobes were densely packed with both neurons and glial cells

<u>Influences on Intelligence</u>

- Cultural and Group Differences
  - Ethnic group difference – various differences in IQ found across different races
    - May be attributed to various causes, including nature vs. nurture argument
  - Sex differences – men and women differ in abilities to perform different kinds of intellectual tasks
    - Men perform better on spatial tasks, target-directed skills, and mathematical reasoning

        - Women perform better on tests of perceptual speed, verbal fluency, mathematical calculation, and precise manual tasks requiring fine motor coordination
- Beliefs, Expectation, and Cognitive Performance
    - Beliefs and expectations can affect how we respond to certain people

Extremes of Intelligence

- Cognitively disabled
    - Vast majority of retarded are mildly disabled, with IQ around 50-70
    - 25% of disabled have biological cause
- Intellectually gifted
    - IQ of 120 or above
    - Often show giftedness in one area

Nonverbal Communication

- Smiles**:** Social lubricants, not an indication of happiness
    - Zygomatic Smile: A real smile that utilizes the upper part of the face
    - Fake Smile: Conceals irritation, not genuine
- Desmond Morris specialized in communication and body language, concluded that fear evolved into smiling. He also deduced the following:
    - Aggression: Tight lipped and bearing teeth
    - Fear: Stretched mouth across corners showing teeth
    - Smiling: Anti-aggression

Eye contact

- Indicates attentiveness, credibility, intensity of feelings
- Makes people more likeable
- Culturally relevant: Asians < Americans < Arabs

Gestures

- Symbols that Canadians use mean different things around the world
    - Ex Nodding up and down means no in Bulgaria and Greece
    - Ex Thumbs up in Iran means Screw You
- Baton Gestures: Gestures that accompany speech and are coordinated. They express a meaning related to the semantic content of speech

Chapter 10 – Motivation and Emotion

- Motivation – process that influences the direction, persistence, and vigour of goal directed behaviour

Perspectives on Motivation

- Instinct Theory and Modern Evolutionary Psychology
  - Instinct (fixed action pattern) – an inherited characteristic, common to all members of a species, that automatically produces a particular response when the organism is exposed to a particular stimulus
  - Theories faded due to circular reasoning (People are greedy. Why? Because greed is an instinct. Why? Because people are greedy.)
  - Modern evolutionary psychologists propose that many motives have evolutionary underpinnings
- Homeostasis and Drive Theory
  - Homeostasis – a state of internal physiological equilibrium that the body strives to maintain
    - Requires a sensory mechanism for detecting changes in internal environment, a response system that can restore equilibrium, and a control centre that receives information from sensors
  - Drive theory – physiological disruptions to homeostasis produce drives, states of internal tension that motivate an organism that reduce this tension
    - Clark Hull proposes that reducing drives is the ultimate goal of motivated behaviour
    - Flaws in theory found in certain behaviours, such as when people skip meals to diet (increases rather than decreases state of arousal)
- Incentive and Expectancy Theories
  - Incentives – environmental stimuli that pull an organism toward a goal
  - Modern incentive theorists emphasize the pull of external stimuli and how stimuli with high incentive value can motivate behaviour, even in the absence of biological need
  - Expectancy x value theory – goal directed behaviour is jointly determined by two factors: the strength of the person's expectation that particular behaviours will lead to a goal, and the value the individual places on the goal (incentive value)
    - Motivation = expectancy x incentive value
  - Extrinsic motivation – performing an activity to obtain an external reward or to avoid punishment
  - Intrinsic motivation – performing an activity for its own sake (enjoyment of the activity)
  - Overjustification hypothesis – giving people extreme rewards to perform activity that they intrinsically enjoy may overjustify that behaviour and reduce intrinsic motivation
- Psychodynamic and Humanistic Theories
  - View motivation within a broader context of personality development and functioning, but take radically different approaches
  - Freud believed that most behaviour resulted from a never-ending battle between unconscious impulses struggling for release and psychological defenses used to keep them under control
  - Abraham Maslow believed that psychology's perspectives ignored a key motive: our striving for personal growth
    - Deficiency needs – concerned with physical and social survival
    - Growth needs – motivate us to develop our potential
    - Proposed concept of need hierarchy, a progression of needs containing deficiency needs at the bottom and growth needs at the top
      - Physiological safety belongingness and love esteem cognitive aesthetic self-actualization (need to fulfill our potential, ultimate human motive)
      - Can only focus on needs of highest level if bottom levels are satisfied

Hunger and Weight Regulation

- **The Physiology of Hunger**
  - Metabolism – body's rate of energy utilization
    - Two-thirds of energy used goes to support basal metabolism, the resting, continuous metabolic work of body cells
  - Immediate energy supply information interacts with other signals to regulate food intake (hunger not necessarily linked to immediate energy needs)
  - Homeostatic mechanisms are designed to prevent people from running low on energy in the first place (organisms will not wait until last second to eat)
  - Many researches believe in a set point, an internal physiological standard, around which body weight is regulated (if weight is altered, homeostatic mechanisms will return body close to original weight)
  - Body has long term signals that adjust appetite and metabolism:
    - Signals that start and terminate a meal
      - Hunger not triggered by empty stomach
        - People with nerves cut to stomach or stomach surgically removed still reported feelings of hunger
      - Sensors in hypothalamus and liver monitor blood glucose concentrations
        - If glucose levels drop, liver converts stored nutrients back into glucose, producing a drop-rise glucose pattern
      - Humans display a temporary drop-rise glucose pattern prior to experiencing hunger
      - Walls of stomach and intestine stretch while eating, send nerve signals to brain to indicate fullness
        - Nutritionally rich food can produce full feeling quicker than equal volume of less nutritious food
      - Patients with removed stomachs can still experience satiety due to chemical signals
        - CCK (cholecystokinin) released into blood after eating, stimulates receptors that decrease eating
    - Signals that regulate general appetite and weight
      - Fat cells secrete leptin (hormone that decreases appetite) to regulate food intake and weight
        - Doesn't directly cause fullness, but affects amount of satiety signals required
      - Obese people have ample leptin in blood due to fat mass, but brain appears insensitive to signals
    - Brain mechanisms
      - Many parts of brain play a role in regulating hunger and eating
        - Lateral hypothalamus triggers hunger
        - Ventromedial hypothalamus ends hunger
          - Both found to not directly affect only hunger, but other factors that would also affect it
      - Paraventricular nucleus (PVN) – cluster of neurons packed with receptor sites for various transmitters that stimulate or reduce appetite
        - When losing weight, less leptin secreted, transmitters for hunger become more active (explains why dieting causes hunger)
- **Psychological Aspects of Hunger**
  - Eating is positively reinforced by the good taste of food and negatively reinforced by hunger reduction
  - Beliefs about caloric content of food, and memory of when and how much we last ate also affect consumption

        - Amnesia patients accepted multiple lunches half four after each other, while non-amnesia did not
    - Attitudes, habits, and psychological needs also regulate intake
        - Women overestimate how thin they must be to meet men's standards, while men overestimated how bulky they must be
- **Environmental and Cultural Factors**
    - Food availability is most obvious environmental regulator of eating
    - Food taste and variety powerfully regulate eating
    - Classical conditioning associates smell and sight of food with taste, triggering hunger
- **Obesity**
    - Genes and environment
        - Heredity influences basal metabolic rate and tendency to store energy as fat or lean tissue
        - Genetic facots account for 40-70% of variation in body mass
        - Experts believe obesity is due to abundance of inexpensive, tasty, high fat foods, a cultural emphasis on getting the best value (causing supersizing of menu items), and technological advances that decrease need for daily physical activity
    - Dieting and weight loss
        - Being fat alters body chemistry and energy expenditure, priming people to stay fat
            - Obese people have higher insulin levels, which convert glucose to fat
- **Eating Disorders**
    - Anorexia nervosa – eating disorder involving a severely restricted food intake
        - Often perfectionists who strive to live up to lofty self-standards
    - Bulimia nervosa – eating disorder involving binge eating followed by a purging of the food
        - Often depressed and anxious, exhibit low impulse control, and lack a stable sense of personal identity and self-sufficiency
    - Caused by environmental, psychological, and biological factors
        - More common in industrialized countries in which beauty is equated with thinness
        - Genetic factors may create a predisposition toward eating disorders
        - Many researchers believe that physiological changes are a response to abnormal eating patterns
            - Once started, the physiological changes perpetuate eating irregularities

<u>Sexual Motivation</u>

- **The Physiology of Sex**
    - Sexual response cycle – four stage cycle experienced during sexual arousal
        - Excitement phase – arousal builds rapidly
        - Plateau phase – respiration, heart rate, vasocongestion, and muscle tension continue to build until there is enough muscle tension to trigger orgasm
        - Orgasm phase – males: rhythmic contractions of internal organs and muscle tissue surrounding the urethra project semen, females: rhythmic contractions of the outer third vagina, surrounding muscles, and uterus
        - Resolution phase – physiological arousal decreases rapidly and the genital organs and tissue return to normal condition
        - Refractory period (male only) – period where orgasm is temporarily incapable of occurring
    - Hypothalamus control pituitary gland, which regulates secretion of hormones called gonadtrophins into bloodstream
        - Affect rate at which gonads secrete androgens (testosterone) and estrogens (estradiol)
        - Hormones have organizational effects that direct the development of male and female sex characteristics

        - Hormones have activational effects that stimulate sexual desire and behaviour
- **The Psychology of Sex**
    - Half of men and fifth of women fantasize about sex at least once a day
        - More sexually active people tend to fantasize more
    - Psychological factors can trigger and inhibit sexual arousal
        - Sexual dysfunction – chronic, impaired sexual functioning that distresses a person
- **Cultural and Environmental Influences**
    - Two psychological viewpoints are relevant to predicting pornography's effects
        - Social learning theory – people learn through observation
            - Rape myths modeled in porn movies can teach people that it is acceptable
        - Catharsis principle – as inborn aggressive and sexual impulses build up, actions that release this tension provide a catharsis that temporarily returns to a more balanced state
            - Viewing porn should provide a safe outlet for releasing tension
- **Sexual Orientation**
    - Refers to one's emotional and erotic preference for partners of a particular sex
    - Modern researchers propose that sexual orientation has three dimensions: self-identity, sexual attraction, and actual sexual behaviour
    - Researchers found one notable pattern among studies of homosexual and heterosexual
        - Even in childhood, homosexuals felt they were different from their same-sex peers, and were more likely to engage in non-gender-conforming activity

<u>Achievement Motivation</u>

- Need for achievement – represents the desire to accomplish tasks and attain standards of excellence
- **Motivation for Success: The Thrill of Victory**
    - People can strive to succeed for two radically different reasons:
        - Motive for success – people are attracted to thrill of victory
        - Fear of failure
- **Fear of Failure: The Agony of Defeat**
    - Measured in psychological tests that ask people to report anxiety in achievement situations
    - Worry associated with fear of failure and performance avoidance goals impairs task performance
- **Achievement Needs and Situational Force**
    - People with strong need for achievement are ambitious and persist longer after encountering difficulties than others
    - In laboratory setting, high-need achievers do not outperform others with relaxed and easy tasks
        - Not true with challenging tasks
    - High-need achievers most likely to strive hard for success when they perceive themselves as personally responsible for outcome, perceive some risk of not succeeding, and there is an opportunity to receive performance feedback
- **Family and Cultural Influences**
    - High need for achievement develops when parents encourage and reward achievement, but don't punish failure
    - Fear of failure develops when achievement is taken for granted by parents, but failure is punished

<u>Motivation in the Workplace</u>

- **Why Do People Work?**
    - Earliest theory held that workers are motivated almost entirely by money

        - Research indicates that many more view personal accomplishment as most important job attribute
    - Research has found that job productivity and job satisfaction are weakly related
- **Enhancing Work Motivation**
    - Job enrichment programs attempt to increase intrinsic motivation by making jobs more fulfilling and providing workers with opportunities for growth
        - A job is most intrinsically motivating when it provides:
            - Skill variety – variety of tasks must be performed
            - Task identity – a whole product is completed
            - Task significance – have an impact on other people
            - Autonomy – freedom to determine work procedures
            - Job feedback – provides clear feedback on performance
    - Learning theory predicts that performance will increase when reinforcers are made contingent on productivity
    - Goal setting is a powerful motivational technique that has increased employee productivity in almost every study
        - Management by objectives – combines goal setting with employee participation and feedback
            - Employee participation – employees meet at least once a year with managers to develop employee goals and plan how to attain them
            - Objective feedback provides opportunities to recognize success

<u>Motivational Conflict</u>

- Motivational goals can conflict with each other (choosing between studying or going to a party)
- Approach-approach conflict – involves opposition between two attractive alternatives (selecting one means losing the other)
    - Conflict is greatest when both alternatives are equally attractive
- Avoidance-avoidance conflict – involves a person facing two undesirable alternatives
- Approach-avoidance conflict – involves being attracted to and repelled by the same goal (a fourth-year student is attracted to job opportunities in a new major, but is repelled by a fifth year of classes)

<u>The Nature and Functions of Emotion</u>

- Emotions – positive or negative feeling states consisting of a pattern of cognitive, physiological, and behavioural reactions
    - Concepts of motivation and emotion are closely linked
- **The Adaptive Value of Emotion**
    - Emotions have important adaptive functions
        - Signal that something important is happening, and shift attention to event
        - Increase chance of survival by energizing, directing, and sustaining adaptive behaviours
    - Barbara Fredrickson suggests positive and negative emotions have different adaptive functions
        - Negative emotions narrow attention and action tendencies so that an organism can respond to a threatening situation with a focused set of responses
        - Positive emotions broaden thinking and behaviour so that we explore, consider new ideas, try out new ways to achieve goals, etc.
    - Emotions are form of social communication
    - Darwin claimed that the expression of emotion intensifies the experience, while Freud claimed that it reduced the experience
        - Studies show that highly aroused subjects show little expressiveness, supporting Freud's theory
- **The Nature of Emotion**
    - Emotions all share four common features:
        - Emotions are responses to external or internal eliciting stimuli

        - Emotional responses result from our interpretation or cognitive appraisal of these stimuli
        - Our bodies respond physiologically to our appraisal
        - Emotions include behaviour tendencies, being either expressive (exhibiting surprise, smiling, crying, etc.) or instrumental (ways of doing something about the stimulus that aroused the emotion, eg. Studying for an anxiety arousing test)
    - The Cognitive Component
        - Cognitions are involved in every aspect of emotion
        - Appraisal processes – idea that emotional reactions are triggered by cognitive appraisals accounts for fact that different people can have different emotional reactions to the same situation
    - The Physiological Component
        - Brain structure and neurotransmitters
            - Subcortical structures (hypothalamus, amygdale, hippocampus) play major roles in emotion
            - Cerebral cortex has many connections with hypothalamus and limbic system, allowing constant communication between cortical and subcortical regions
                - Ability to regulate emotion depends heavily on prefrontal cortex
            - Joseph LeDoux revealed important links between cortex and limbic system
                - Thalamus sends messages through two pathways: to cortex, and to amygdale
                - Amygdale can receive input and generate emotional response before cortex can interpret what caused reaction
                - Enables organism to respond quickly
                - Explains why people have different reactions than emotion they experience
            - Amygdale has emotional processing abilities without conscious awareness
            - Brain-damaged patients suggest two neural bases for conscious awareness and emotional response
                - Damaged hippocampus (memory impairment) can develop a conditioned emotional response despite not learning connection between CS and UCS
                - Damaged amygdale can describe the CS and UCS relation, but cannot develop a conditioned fear response
        - Hemispheric activation and emotion
            - Damage to left hemisphere accentuated negative emotions, while right hemisphere damage was linked to indifference
        - Autonomic and hormonal processes
            - Fight-or-flight response produced by sympathetic branch of autonomic nervous system and hormones from endocrine system
                - Hormones effect last much longer than nervous system
    - The Behavioural Component
        - Expressive behaviours – observable behavioural indications of subjectively experienced emotions
            - Empathy – the capacity for experiencing the same emotional response being exhibited by another person
        - Darwin argued that emotional displays are products of evolution, and they contribute to species survival
            - Two findings suggest humans have fundamental emotional patterns:
                - Expressions of certain emotions are similar across variety of cultures

        - Children who are blind from birth express basic emotions in same way as sighted children
    - Emotions can be organized in terms of hierarchy ranging from most universal to more subtle
        - Most basic are positive and negative affect (interest and disinterest)
        - Basic emotions described by evolutionary theorists appear at second level
        - Third level consists of subtle emotions (love)
  - Different parts of face provide best cues for recognizing various emotions
    - Eyes provide major cues for fear and sadness
    - Mouth provides cue for happiness and disgust
    - Forehead provides cue for surprise
    - Anger involves all areas
- Cultural display rules – norms for emotional expression in a given culture
- Instrumental behaviours – emotional coping behaviours that are directed at achieving the goal or performing the task that is relevant to the emotion
  - Fall into five broad categories:
    - Moving toward others (love)
    - Moving away from others (fear, revulsion)
    - Moving against others (anger)
    - Helplessness
    - Submission
  - Relation between arousal and performance depends on arousal level and task complexity
    - Higher task complexity requires lower arousal for maximum performance

<u>Interactions Among the Components of Emotion</u>

- **The James-Lange Somatic Theory**
  - Somatic theory of emotions – emphasizes the causal role of bodily responses in experiencing of emotion
    - Physiological reactions determine emotion (e.g. crying causes us to feel sad)
    - Eliciting stimulus autonomic response perception of emotion
- **The Cannon-Bard Theory**
  - People's bodies do not respond instantaneously to emotional stimulus, yet people experience emotion immediately
    - Proposed that when we encounter emotional situation, thalamus sends messages to both cortex and body's organs
    - Eliciting stimulus thalamus autonomic response AND conscious emotion
  - Animals with severed nerves from organs to brain still could experience emotion
  - Facial feedback hypothesis – feedback to brain from face might play a key role in determining the nature and intensity of emotion that we experience
    - Positive or negative emotional responses can be triggered by contractions of specific face muscles
    - Vascular theory of emotional feedback – tensing facial muscles alters temperature of blood entering brain by controlling volume of air inhaled by nose
      - Cooling blood causes positive effect
      - Warming blood causes negative effect
- **Cognitive-Affective Theories**
  - Strong emphasis in link between cognitive appraisal and arousal
    - All emotional responses require some sort of appraisal
  - Emotional response depends on how environmental stimuli is interpreted
  - Lazarus's theory – eliciting stimulus appraisal of stimulus bodily arousal

- Schachter's two-factor theory of emotion – arousal and cognitive labeling based on situational cues are the critical ingredients in emotional experience
    - Eliciting stimulus appraisal bodily arousal (determines intensity of) perception of emotion
    - Intensity of arousal tells us strength of emotion, but situational cues tell us what the emotion is
    - Subjects were injected with epinephrine (increases arousal), no emotion produced unless subjects are exposed to emotional stimulus

Chapter 11 – Development over the Life Span

Major Issues and Methods

- Developmental psychology examines changes in biological, physical, psychological, and behavioural processes over age
- Four issues guide developmental research:
    - Nature and nurture
    - Critical and sensitive periods
        - Critical period – an age range during which certain experiences must occur for normal development
        - Sensitive period – an optimal age range for certain experiences, but no critical range
    - Continuity versus discontinuity
    - Stability versus change
- Five developmental functions:
    - No change – an ability from birth remains constant over life span
    - Continuous – an ability that develops gradually and then remains constant
    - Discontinuity – an ability that progresses in stages
    - Inverted U-shaped function – an ability that peaks at a certain age, then decreases
    - U-shaped function – an ability that disappears temporarily
- Different designs used to research:
    - Cross-sectional design – research design that compares people of different age groups at same point in time
        - Drawback in that different age groups (cohorts) grew up in different periods
    - Longitudinal design – repeatedly tests same cohort as it grows older

Prenatal Development

- Consists of three stages:
    - Germinal stage – first two weeks, zygote (fertilized egg) is formed
    - Embryonic stage – second to eighth week, zygote becomes embryo (placenta and umbilical cord form, organs form)
    - Fetal stage – after nine weeks, embryo becomes fetus (bodily systems develop, eyes open at 24 weeks, attains age of viability at 28 weeks)
- Y chromosome contains TDF (testis-determining factor) gene which initiates development of testes at around 6-8 weeks
- Various environmental influences can affect development
    - Teratogens – environmental agents that cause abnormal development (radiation, drugs, alcohol, viruses, toxins)
        - Rubella can severely damage nervous system (German measles)
        - STDs cause brain damage, blindness, deafness and HIV positive status
        - Alcohol can cause two diseases:
            - FAS – Fetal alcohol syndrome
                - Cluster of defects include unusual facial features, small malformed brains, motor impairments, low IQ and social skills
            - FAE – Fetal alcohol effects, less severe pattern of symptoms than FAS
        - Nicotine causes miscarriage, premature birth, and low birth weight
    - Maternal Malnutrition – Miscarriage, premature birth, impaired brain development
    - Maternal Stress – Premature birth, infant irritability, attention deficits
- First trimester is the most vulnerable
- Myelinization of the nerves occurs
    - Sensory and motor areas are myelinated early
    - Association areas become myelated later
- Neural Darwinism
    - 30-60% more neurons in an infant than in an adult
    - Use them or lose them

Infancy and Childhood

- **The Amazing Newborn**
  - Newborn sensation and perception
    - Vision is limited by poor acuity, lack of coordinated eye movements, and tunnel vision
    - Newborns orient to significant stimuli
    - Prefer patterned and more complex images
  - Newborn learning
    - After repeated exposure to certain sound, infants begin to stop turning to see source of sound, but would turn towards new sound
    - Rapidly acquire classically conditioned responses
- **Sensory-Perceptual Development**
  - Visual field expands to almost adult size by six months, acuity continues to develop afterwards
  - Sound localization disappears in second month of life, returns after four or five months
- **Physical, Motor, and Brain Development**
  - Maturation – genetically programmed biological process that governs growth
  - Physical and motor development follows principles
    - Cephalocaudal principle – reflects tendency for development to proceed in head-to-foot direction
    - Proximodistal principle – states that development begins along innermost parts of body and continues outward
  - Brain matures from inner parts (that govern basic survival functions) to cortex
  - Reflexes – automatic, inborn behaviours elicited by specific stimuli
  - Physical and motor development are also influenced by experience and environment
    - Regularly massaged infants gain weight more rapidly and show fast neurological development
    - Visual deprivation can damage visual abilities
- **Cognitive Development**
  - Brain development
    - At birth – 25% of adult brain weight
    - 6 months – 50% of adult brain weight
      - cells become larger and neural networks form
      - growth rate slows in later childhood
    - 5 years - 90% of adult brain weight
  - Newborns have an innate preference for faces as they track face like stimuli
    - Newborns look at outside features of faces while older infants look at eyes and mouth, just as adults do
  - Orientation and Habituation
    - Orienting Reflex – humans, including infants, pay more attention to novel than familiar stimuli
    - Habituation – Infants get bored with repeated presentations of the same thing
    - Habituation Paradigm – babies are sensitive to statistics, they know when something is off Ex Red ping pong ball in a white ping pong ball bin
  - Newborns such more when they hear their native language and when they hear their moms voice

- Piagets primary method was to ask children to solve problems and then ask about their reasoning, determined that children think radically different than adults
- Piaget believed that development results from maturation and experience, and that thinking changes qualitatively with age, stages
  - Brain builds schemas (organized patterns of thought)
  - Two processes involved in acquiring new schemas
    - Assimilation – process by which new experiences are incorporated into existing schemas (child who sees a horse for first time may call it a "big dog")
    - Accommodation – process by which new experiences cause existing schemas to change (child will realize the "big dog" isn't a dog)
  - Four major stages of cognitive growth:
    - Sensorimotor stage (Birth to 2) – children understand their world primarily through sensory experience and physical interaction
      - Around eighteen months, achieve object permanence (ability to understand that an object continues to exist even out of sight)
      - Pseudoimitation (child can imitate actions just produced) present
    - Preoperational stage (2-7) – children represent the world symbolically through words and mental images, but do not understand basic mental operations
      - Cannot understand concept of conservation (principle that basic properties of objects, such as mass and volume, stay the same despite change in outward appearance)
      - Exhibit egocentrism (difficulty in viewing world from someone else's perspective – children believe that others perceive world as they do)
    - Concrete operational stage (7-12) – children can perform basic mental operations concerning problems that involved concrete objects and situations
    - Formal operational stage (12+) – children are able to think logically and systematically about concrete and abstract problems
- Universal tests show that the general cognitive abilities associated with the four stages appear to occur in the same order across cultures (Piaget is only a partial dumbass)
  - Culture has been found to influence cognitive development
  - Cognitive development within each stage seems to proceed inconsistently
- Zone of proximal development – the difference between what a child can do independently and what the child can do with assistance from adults (social interaction affects development)
- Cognitive development is best examined within information processing framework
  - Processing speed improves during childhood
  - Memory capabilities expand significantly
  - Younger children lack metacognition (awareness of one's own cognitive processes)
- Theory of mind – a person's beliefs about the mind and the ability to understand other people's mental states

- **Moral Development**
  - Lawrence Kohlberg developed a stage model of cognitive development:
    - Preconventional stage – moral judgments are based on anticipated punishments or rewards
    - Conventional stage – moral judgments are based on conformity to social expectations, laws, and duties

        - Postconventional stage – moral judgments are based on well though out, general moral principles
    - Researchers have studied moral reasoning throughout all cultures
        - Moral reasoning changes from preconventional to conventional
        - Postconventional reasoning is relatively uncommon
        - Stages cannot be skipped
    - Postconventional reasoning occurs more often among Western culture, though this can be attributed to different moral values
- **Personality and Social Development**
    - Erik Erikson believed that personality develops through confronting a series of eight major psychosocial stages (each of which involves a different conflict over how we view ourselves in relation to others)
        - Four crises that occur in infancy and childhood:
            - Basic trust versus basic mistrust
            - Autonomy versus shame and doubt
            - Initiative versus guilt
            - Industry versus inferiority
    - Attachment – the strong emotional bond that develops between children and caregivers
        - Imprinting – sudden, biologically primed form of attachment
        - Freud's Cupboard Theory – attachment to caregiver is side-effect of ability to provide basic satisfaction (food)
        - Harry Harlow found that contact comfort is more important that the provision of nourishment
        - John Bowlby proposed that attachment develops in three phases:
            - Indiscriminate – newborn behaviours evoke caregiving from adults
            - Discriminate – infants direct attachment to ore familiar caregivers
            - Specific – infants develop meaningful attachment to specific people
        - Stranger anxiety – distress over contact with unfamiliar people
        - Separation anxiety – distress over being separated from a primary caregiver
        - Strange Situation Test – test for examining infant attachment
            - Anxious resistant infants are fearful with mother present, demand attention, and are distressed when she leaves
            - Anxious avoidant infants show few signs of attachment and seldom cry without mother
            - Most infants found to be securely attached (enjoy presence of mother)
    - Different types of attachment deprivation can affect infants in several ways
        - Isolated children and monkeys did not develop properly
        - Infancy is a sensitive period in which initial attachment to caregivers forms most easily and facilitates development
    - Daycare affects children's development in various ways
        - Does not disrupt attachment to parents
        - Infants in daycare are slightly less engaged and sociable towards mothers
        - Infants from low income families with high quality daycare are better socially adjusted
    - Different styles of parenting can also affect children's development
        - Authoritative – controlling, but warm, and establish and enforce clear rules within a caring, supportive atmosphere
            - Children: higher self esteem, higher achievers, fewer conduct problems, more considerate
        - Authoritarian – exert control over children, but do so with a cold, unresponsive, or rejecting relationship
            - Children: lower self-esteem, less popular, perform poorly in school
        - Indulgent – warm and caring, but do not provide guidance and discipline
            - Children: immature and self-centred
        - Neglectful – provide neither warmth, nor rules, nor guidance

            - Children: insecurely attached, low achievement motivation, disturbed relationships, impulsive, and aggressive
    - Parents play role in helping children develop gender identity
        - Gender identity – sense of "maleness" or "femaleness"
        - Gender constancy – understanding that being of a gender is permanent (develops around age six to seven)
        - Socialization – the process by which we acquire beliefs, values, and behaviours of a group
            - Plays key role in shaping gender identity and sex-role stereotypes

Adolescence

- **Physical Development**
    - Puberty – period of rapid maturation in which the person becomes capable of sexual reproduction
    - Early maturation tends to have more positive outcomes for boys than girls
        - Boys acquire strength and size
        - Girls more likely to develop eating disorders, smoke, drink, and have problems academically
- **Cognitive Development**
    - Capacity for abstract reasoning increases substantially during adolescence
    - Adolescent egocentrism – highly self-focused thinking
        - Adolescents overestimate the uniqueness of their feelings and experiences
        - Always feel that they are "on stage" and being watched and judged
- **Social and Personality Development**
    - Erik Erikson interviewed many adolescents to understand sense of identity
        - Many had identity diffusion (had not yet gone through identity crisis, and remain uncommitted to a coherent set of values)
        - Others found to be in foreclosure (adopted an identity without going through a crisis)
        - Moratorium – adolescents experiencing a crisis, but have not yet resolved
        - Identity achievement – adolescents who have gone though a crisis and successfully resolved it
    - Most adolescents report getting along "well" and "fairly well" with parents
        - Adolescents often agree with parents' right to make rules, but not with some issues
        - Girls believed to be granted autonomy at a later age than boys

Adulthood

- **Physical Development**
    - Physical functioning peaks in young adulthood, and declines at mid-life
- **Cognitive Development**
    - Several theorists propose a fifth stage of cognitive development
        - Post-formal thought – people can reason logically about opposing points of view and accept contradictions and irreconcilable differences
    - Information processing and memory change into adulthood
        - Perceptual speed (reaction time) declines steadily
        - Memory for new factual information, spatial memory, and memory recall decline
    - Fluid intelligence declines earlier than crystallized intelligence
    - Regular exercise and perceptual-motor activities may preserve cognitive abilities
    - Wisdom scores found to rise from age 13 to 25, and then remain stable
- **Social and Personality Development**
    - Social clock – a set of cultural norms concerning optimal age range for work, marriage, parenthood, and other major life experiences
    - Erik Erikson proposed different stages and critical events

        - Intimacy versus isolation (20-40)
        - Generativity versus stagnation (40-60) – how generous a person becomes
        - Integrity versus despair (60+) – a sense of completeness and fulfillment
    - People who live together prior to marriage are at higher risk of divorce
        - Not causal, most likely due to lack of religiousness, less commitment to marriage
    - U-shaped relation found in marital satisfaction
        - Happiness greatest before children, drops during children, rises again after children leave home
    - Various stages affect the establishment of a career
        - Growth stage (childhood to mid-twenties) – form initial impressions about types of jobs we like and dislike
        - Exploration stage (immediately after) – form tentative ideas about a preferred career and pursue necessary training
        - Establishment stage (mid-twenties to mid-forties) – begin to understand whether they made correct choice
        - Maintenance stage (end of establishment) – become more satisfied with choice
        - Decline stage – investment in work decreases, followed by retirement
    - Little evidence that most people experience mid-life crisis
    - Elisabeth Kubler-Russ found five stages that terminally ill patients experience as they cope with death
        - Denial, anger, bargaining for life, depression, acceptance

Chapter 16 – Behaviour in a Social Context

Social Thinking and Perception

- **Attribution: Perceiving the Causes of Behaviour**
  - Attributions – judgments about the causes of behaviour and outcomes
  - Fritz Heider maintained that attempts to understand behaviour involve different types of attribution
    - Personal attribution – people's behaviour is caused by their characteristics
    - Situational attribution – aspects of the situation cause behaviour
  - Three types of information determine attribution we make
    - Consistency (is the decision made always consistent)
    - Distinctiveness (is the decision distinct to a situation, or often made)
    - Consensus (how do other people respond)
      - When these three are higher, the decision made is a situational attribution
  - Fundamental attribution error – tendency to underestimate the impact of the situation and overestimate the role of personal factors when explaining other's behaviour
  - Self-serving bias – making relatively more personal attributions for successes and more situational attributions for failure
  - Cultural influences affect attributions
    - Participants from India make more situational attributions, and Americans make more personal attributions
- **Forming and Maintaining Perceptions**
  - Primacy effect – tendency to attach more importance to the initial information that we learn about a person
  - Stereotype – generalized beliefs about a group or category of people (type of schema)
  - Self-fulfilling prophecy – occurs when people's erroneous expectations lead them to act toward others in a way that brings about the expected behaviours, thereby confirming the original impression
- **Attitudes and Attitude Change**
  - Attitude – a positive or negative evaluative reaction toward a stimulus
    - Come from conditioning, social learning, and direct experience
  - Three factors explain why attitude-behaviour relationship is sometimes strong and sometimes weak:
    - Attitudes influence behaviour more strongly when counteracting situational factors are weak
      - Theory of planned behaviour – intention to engage in a behaviour is strongest when we have a positive attitude toward that behaviour, when perceptions of what others think support our attitudes, and when we believe the behaviour is under our control
    - Attitudes have a greater influence on behaviour when we are aware of them and when they are strongly held
    - General attitudes are better at predicting general classes of behaviour, and specific attitudes are better at predicting specific behaviours
      - No relation between general attitude toward religion and specific religious behaviours, but general index of religious behaviours is correlated with general attitudes
  - Theory of cognitive dissonance – people strive for consistency in their cognitions
    - If a person had two contradicting cognitions, they experience an uncomfortable state of tension called cognitive dissonance, and reduce it by changing or adding a cognition
    - It is possible to change someone's attitude by inducing them to engage in counterattitudinal behaviours (behaviour that contradicts one's attitude)
  - Self-perception theory – the theory that we make inferences about our own attitudes by observing how we behave

        - Dissonance theory better explains the changing of attitudes after behaving in ways that contradict it
    - Persuasion involves a communicator who delivers a message through a channel to an audience within a surrounding context
        - The communicator
            - Communicator credibility (how believable communicator is) is key to effective persuasion
            - Credibility has two major components: expertise and trustworthiness
        - The message
            - More effective to present both sides of argument, and refute opposing side
            - More effective to present moderate argument as opposed to extreme
            - Fear arousal works best when message evokes moderate fear
        - The audience
            - Central route to persuasion – occurs when people think carefully about the message and are influenced because they find arguments compelling
            - Peripheral route to persuasion – occurs when people do not scrutinize the message, but are influenced mostly by other factors, such as communicator attractiveness or emotional appeal
            - People often follow a central route when the message is personally relevant
            - People with high need for cognition (enjoy analyzing issues) will follow central route
            - People with low self esteem, high need for social approval are more easily influenced

<u>Social Influence</u>

- **The Mere Presence of Others**
    - Studies found that performance can be enhanced or diminished by the presence of others
    - Explained by the presence of others leading to heightened arousal, and then becoming more likely to perform whatever behaviour is the dominant response to that situation
        - A difficult situation will lead to a dominant response of errors
        - A simple or well-learned situation will lead to a dominant response of enhanced performance
    - Social facilitation – an increased tendency to perform one's dominant response in the mere presence of others
- **Social Norms**
    - Social norms – shared expectations about how people should think, feel, and behave
    - Social role – a set of norms that characterizes how people in a given social position ought to behave
        - Role conflict occurs when the norms of different roles clash
- **Conformity and Obedience**
    - Norms can only influence behaviour if people conform to them
    - Two types of conformity:
        - Informational social influence – following the opinions or behaviours of other people because we believe they have accurate knowledge and what they are doing is "right"
        - Normative social influence – conformity motivated by gaining social acceptance and avoiding social rejection
    - Factors that affect conformity:
        - Group size – conformity increases to a point with increases in group size, but then levels off
        - Presence of a dissenter – when one of the group disagrees, conformity of another individual is greatly reduced

- Minority influence is powerful if kept highly consistent over time
- Factors that influence destructive obedience:
  - Remoteness of the victim – greater obedience when learner is out of sight
  - Closeness and legitimacy of the authority figure – greater obedience when the figure was close and perceived as legitimate
  - Cog in a wheel – obedience increases when someone else does the dirty work
  - Personal characteristics – personal characteristics of individuals rarely influence obedience
- Various compliance techniques:
  - Norm of reciprocity – the expectation that when others treat you well, we should respond in kind
  - Door-in-the-face technique – a persuader makes a large request, expecting rejection, and then presents a smaller request
  - Foot-in-the-door technique – a persuader gets you to comply with a small request first and later presents a larger request
  - Lowballing – a persuader gets you to commit an action and then, before you actually perform the behaviour, increases the cost of the behaviour

- **Crowd Behaviour and Deindividuation**
  - Deindividuation – a loss of individuality that leads to disinhibited behaviour
    - Caused by anonymity to outsiders, where the conditions make an individual less identifiable to people outside the group
- **Group Influences on Performance and Decision Making**
  - Social loafing – the tendency for people to expend less individual effort when working in a group
    - Caused by a collective effort model (people will put forth effort only to the extent that they expect their effort to contribute to a goal)
    - More likely to occur when people believed individual performance within the group is not monitored, the goal has a less personal value, the group has a less personal importance, and the task is simple and the person's input is redundant with that of the other group members
  - Group polarization – when a group of like-minded people discusses an issue, the average opinion of group members tends to become more extreme
    - Individuals attracted to a group may be motivated to adopt a more extreme position to gain group approval
    - During group discussions, people hear arguments supporting their positions they had not previously considered, making the position seem even more valid
  - Groupthink – the tendency for group members to suspend critical thinking because they are striving to seek agreement
    - Most likely to occur when a group is under high stress to reach decision, is isolated from outside input, has a directive leader who promotes a personal agenda, and has high cohesion (a spirit of closeness and ability to work well together)

<u>Social Relations</u>

- **Affiliation and Interpersonal Attraction**
  - Craig Hill suggests that we affiliate with others for four basic reasons: to obtain positive stimulation, to receive emotional support, to gain attention, and to permit social comparison (comparing our beliefs, feelings, and behaviours to those of others)
  - Causes of initial attraction:
    - Proximity and mere exposure – more likely to develop a relationship with people who are physically closer
      - Mere exposure effect – repeated exposure to a stimulus increases out liking for it (initial reaction must be neutral or mildly positive)
    - Similarity – people are more attracted to others who are similar to themselves
    - Physical attractiveness – attractiveness plays a great role in attraction

                - Matching effect – in romantic relationships, the tendency for partners to have a similar level of physical attractiveness
                - Halo effect – physical attractiveness leads to people seeing other positive attributes in a person
        - Social structure theory – men and women display different mating preferences because society directs them into different social roles
        - Social penetration theory – relationships progress as interactions between people become broader, involving more areas of their lives, and deeper, involving more intimate and personally meaningful areas
        - Social exchange theory – the course of a relationship is also governed by rewards and costs of the partners experience
            - The overall outcome (rewards minus costs) is positive or negative
            - Outcome is compared against two standards:
                - Comparison level – outcome that a person has gown to expect in relationships
                - Comparison level for alternatives – focuses on potential alternatives to the relationship
        - The matching hypothesis – people are friends and in relationships with those who are similar in level of attractiveness to themselves
- **Love**
    - Different types of love:
        - Passionate love – involves intense emotion, arousal, and yearning for a partner
        - Compassionate love – involves affection, deep caring about a partner's well-being, and a commitment to being there
        - Triangular theory of love – focuses on intimacy, commitment, and passion
            - When all loves are present, consummate love exists
    - Cognitive-arousal model – the passionate component of love has interacting cognitive and physiological components
        - Emotional arousal caused by another factor can be misinterpreted as love
        - Transfer of excitation – arousal as being due to another source
- **Prejudice and Discrimination**
    - Prejudice – a negative attitude toward people based on their membership in a group
        - Cognitive component (beliefs/expectations about group members), affective component (like or dislike for group), behavioural component (act of discrimination)
    - Discrimination – treating people unfairly based on prejudices
    - Quicker reaction time found in response to word pairs that seem to be associated ("white, pleasant" responded to faster than "black, pleasant")
    - Several cognitive and motivational causes of prejudice:
        - Categorization and us-them thinking – tendency to categorize objects and people
            - Out-group homogeneity bias – tendency to view members of other groups as more similar to one another than members of your own group (they are all alike, but we are diverse)
        - Stereotypes and attributional distortions
    - Motivational roots of conflict:
        - Realistic conflict theory – competition for limited resources fosters prejudice
        - Social identity theory – prejudice stems from a need to enhance self-esteem
    - Stereotype threat – stereotypes create a fear and self-consciousness among stereotyped group members that they will live up to other people's stereotypes
    - Equal status contact – prejudice is most likely reduced when people engage in close contact, have equal status, work to achieve a common goal that requires cooperation, and are supported by broader social norms
- **Pro-Social Behaviour**
    - What motivates pro-social behaviour?
        - Norm of reciprocity – we should reciprocate when others treat us kindly

        - Norm of social responsibility – people should help others and contribute to the welfare of society
        - Empathy-altruism hypothesis – altruism does exist, and it is produced by empathy, the ability to put oneself in the place of another and to share what the person is experiencing
        - Negative state relief model – high empathy causes us to feel distress when we learn of others' suffering, and helping them reduces our own distress
    - When do people help?
        - Bystander intervention is a five step process:
            - Situation must be noticed, situation must be decided to be an emergency (social comparison – observing how others respond to the situation), bystander must assume responsibility to intervene (diffusion of responsibility – "if I don't help, someone else will), bystander must be confident (self-efficacy) in dealing with situation, bystander must decide on perceived costs of intervening
        - Bystander effect – the presence of multiple bystanders inhibits each person's tendency to help, largely due to social comparison or diffusion of responsibility
    - Whom do we help?
        - Three prominent factors in deciding who to help:
            - Similarity, gender (men are more likely to help women, women help everyone equally), perceived responsibility (people more likely to receive help when need for aid is viewed as caused by factors beyond their control)
        - Just world hypothesis – because people want to view the world as fair, they perceive that people get what they deserve

- **Aggression**
    - Biological factors in aggression
        - Heredity partly determines aggression
        - Aggression involves activity of amygdale, hypothalamus, and frontal loves
        - Higher testosterone levels contribute to greater social aggression
    - Frustration-aggression hypothesis – frustration inevitably leads to aggression, and all aggression is the result of frustration
        - DISPROVED – people do not always respond with aggression, and other factors can cause aggression
    - Aggression can be learned
    - Psychological factors in aggression
        - When negative behaviour towards us is perceived intended, we are more likely to become angry
        - Degree of empathy can affect aggression
        - Ability to regulate emotions can affect aggression
        - Catharsis – performing an act of aggression discharges aggressive energy, and temporarily reduces our impulse to aggress

Chapter 15 – Stress, Coping, and Health

The Nature of Stress

- Stress viewed as in three different ways (stimulus, response, and organism-environment interaction)
    - Stimulus (stressors) – situations that place demands on organisms that tax or exceed their resources
    - Stress – a pattern of cognitive appraisals, physiological responses, and behavioural tendencies that occurs in response to a perceived imbalance between situational demands and the resources needed to cope with them
- **Stressors**
    - Stressors range in severity
        - Microstressors – daily hassles and everyday annoyances we encounter
        - Catastrophic events – natural disasters, acts of war, etc.
    - Life event scales – questionnaires that measure the number of positive and negative life events that have occurred over a specific period of time
- **The Stress Response**
    - Four aspects of appraisal process are of particular significance:
        - Primary – appraisal of demands of situation
        - Secondary – appraisal of resources available to cope with it
        - Judgments of what consequences of situation could be
        - Appraisal of personal meaning (what the outcome might imply about us)
- **Chronic Stress and the GAS**
    - General adaptation syndrome (GAS) – a physiological response pattern to strong and prolonged stressors
        - Consists of three phases:
            - Alarm reaction – a rapid increase in physiological arousal
                - Occurs due to sudden activation of sympathetic nervous system and release of hormones
            - Resistance – body's resources continue to be mobilized so that the person can function despite the presence of a stressor
                - Length of stage depends on severity of stress, individual's health, available support, and other factors
                - Adrenal glands release epinephrine, norepinephrine, and cortisol to maintain arousal
            - Exhaustion – body's resources are dangerously depleted
                - Occurs when stressor is intense and persists for too long

Stress and Health

- **Stress and Psychological Well-Being**
    - Studies of results of catastrophic events has found average increase of 17% in rates of psychological disorders
    - Rape trauma syndrome – a pattern of cognitive, emotional, and behavioural responses that occurs in response to being raped
    - Neuroticism – a personality trait that involves the tendency to experience high levels of negative affect and to behave in self-defeating ways
        - People high in neuroticism have heightened tendency to experience negative emotions and to involved in stressful situations through maladaptive behaviours
- **Stress and Illness**
    - Stress can combine with other physical and psychological factors to influence the entire spectrum of physical illness
    - Stress can trigger illness by causing a breakdown in immune system functioning
    - Stressors can release sufficient stress hormones to induce structural changes in the hippocampus that last for a month or longer

Vulnerability and Protective Factors

- Vulnerability factors – increase people's susceptibility to stressful events (includes lack of a support network, poor coping skills, tendencies to become anxious, etc.)
- Protective factors – environmental or personal resources that help people cope more effectively (includes social support, coping skills, and personality factors such as optimism)
- **Social Support**
  - One of the most important environmental resources that people can have
  - Enhances immune system functioning
  - Discussing traumatic incidences can enhance immune system functioning
- **Cognitive Protective Factors: The Importance of Beliefs**
  - Hardiness – a stress-resistant personality pattern that involves the factors of commitment, control, and challenge
    - Hardy people are committed to work, families, and believe what they are doing is important
    - View themselves as having control over outcomes (strongest stress buffer)
    - Appraise demands of situations as challenges or opportunities, rather than threats
  - Coping self-efficacy – beliefs relating to our ability to deal effectively with a stressful stimulus or situation
  - Optimistic people are at lowered risk for anxiety and depression when confronted with stress
- **Physiological Reactivity**
  - Physiological toughness – relations between two classes of hormones secreted by the adrenal glands in the face of stress
    - Catecholamines (which includes epinephrine and norepinephrine) and corticosteroids (cortisol) mobilize the body's fight-or-flight response
    - Cortisol's arousal affects last much longer, seem more damaging than those produced by catecholamines
      - Reduces immune system functioning and helps create fatty deposits in arteries that lead to disease
      - Catecholamines increase immune system functioning
  - Physiological toughness includes:
    - A low resting level of cortisol, low levels of cortisol secretion in response to stressors, and a quick return to baseline level of cortisol after stress is over
    - A low resting level of catecholamines, but a quick and strong catecholamine response when the stressor occurs, followed by a quick decline in catecholamine secretion and arousal when the stressor is over
  - Fact that physical exercise entail catecholamine-produced arousal may help account for exercise's health-enhancing effects

Coping with Stress

- Coping strategies when faced with a stressor can be divided into three classes:
  - Problem focused coping – attempt to confront and deal directly with demands of the situation, or change the situation so that it is no longer stressful (Examples: studying for a test, going directly to another person to work out a misunderstanding, etc.)
  - Emotion focused coping – attempt to manage the emotional responses that result from it (Examples: appraising the situation in a manner that minimizes the emotional impact, avoidance or acceptance of the stressful situation)
  - Seeking social support – turning to others for assistance and emotional support in times of stress
- Problem focused coping and seeking social support often demonstrate favorable adjustment in stressors, while emotion focused coping often predict depression and poor adjustment
- In hostage studies, problem focused coping and seeking social support fare better than those with no strategy, but emotion focused coping was found to help individuals adapt most to uncontrollable conditions of captivity

- People with high stress who are too emotionally restrained to express negative feelings have a higher likelihood of developing cancer
- Men are more likely to use problem focused coping, while women often seek social support and use emotion focused coping

Pain and Pain Management

- **Biological Mechanisms of Pain**
    - Gate control theory – the experience of pain results from the opening and closing of "gating mechanisms" in the nervous system
        - Sensations from two types of sensory fibres enter the spinal cord, and activate neurons that travel up toward the brain regions responsible for our perception of pain
        - Thin fibres carry sharp pain impulses, thick fibres carry dull pain information
        - Experience of pain depends on ratio of thin-to-thick fibre transmission
        - Thin fibre activity opens spinal cord "gates", while thick fibre activity closes them
            - rubbing a bruise or scratching an itch stimulate thick fibres, and produce relief
            - acupuncture may stimulate mostly thick fibres, causing pain relief
    - Endorphins – natural opiate-like substances that are involved in pain reduction
        - Inhibit release of neurotransmitters involved in synaptic transmission of pain impulses
        - Individuals often differ in pain experiences despite identical pain stimulation
            - Linked in variations in number of receptors for endorphins and ability to release endorphins
        - Stress-induced analgesia – a reduction in, or absence of, perceived pain that occurs under stressful situations
- **Cultural and Psychological Influences on Pain**
    - Interpretation of pain impulses sent to brain depends in part on experiences and beliefs, and both are influenced by our culture
    - Women report pain more frequently than men
    - Differences in pain experience also occur within culture
        - Soldiers often require less pain medication than civilians for war-related wounds, since soldiers see the injury as a ticket home to their families, while civilians see the wound as a life disruption
    - Placebos – substances that have no medicinal value but are thought by the patient to be helpful
    - People in control of their own medication often feel less intense pain and will give themselves less medication than those with prescriptions
- **Psychological Techniques for Controlling Pain and Suffering**
    - Cognitive strategies
        - Dissociation – involves dissociating, or distracting, oneself from the painful sensory input
        - Associative – involves focusing attention on the physical sensations and study them in a detached and unemotional fashion, without labeling them as painful or difficult to tolerate
    - Surgical patients with informational interventions show better courses of recovery and require less pain medication than those treated in a traditional fashion

Health Promotion and Illness Prevention

- Health psychology – the study of psychology and behavioural factors in the prevention and treatment of illness and in the maintenance of health
- Health related behaviours fall into two main categories:
    - Health enhancing behaviours – serve to maintain or increase health
    - Health compromising behaviours – promote development of illness

- **How People Change: The Transtheoretical Model**
    - Transtheoretical model – identifies six major stages in process of how people change
        - Precontemplation (problem unrecognized or unacknowledged), Contemplation (recognition of problem, contemplating change), Preparation (preparing to try and change), Action (implementing change strategies), Maintenance (behaviour change is being mastered), Termination (permanent change, no maintenance efforts required)
        - People do not go through stages in smooth sequence
            - Often go back and forth, and failure is likely if previous stages not mastered
- **Increasing Behaviours That Enhance Health**
    - Aerobic exercise – sustained activity that elevates heart rate and increases the body's need for oxygen
    - Yo-yo dieting – severe intermittent dieting that results in large weight fluctuations
        - Results in accumulation of abdominal fat, increased risk of dying from cardiovascular disease

<u>Combating Substance Abuse</u>

- Motivational interviewing – a treatment approach that avoids confrontation and leads clients to their own realization of a problem and to increased motivation to change
- Multimodal treatments – substance abuse interventions that combine a number of treatments
    - Often combines a biological measure (nicotine patch) with psychological measures
        - Aversion therapy – undesired behaviour is associated with an aversive stimulus, such as nausea, to create a negative emotional response to the substance
- Relapses – a return to the undesirable behaviour pattern
    - Often occurs after a lapse (one time "slip") in a high-risk situation (stressful event, social pressure)
    - Lapse followed by abstinence violation effect (a person blames himself and concludes that he is incapable of resisting high risk situations)
- Harm reduction – a prevention strategy that is designed not to eliminate a problem behaviour, but to reduce harmful consequences

Chapter 12 – Personality

- Personality – the distinctive and relatively enduring ways of thinking, feeling, and acting that characterize a person's responses to life situations
- Aspects of personality have three characteristics:
    - Seen as components of identity that distinguish that person from other people
    - Behaviours viewed as being caused primarily by internal rather than environmental factors
    - Behaviours seem to fit together in a meaningful fashion, suggesting an inner personality that guides and directs behaviour

<u>The Psychodynamic Perspective</u>

- **Freud's Psychoanalytic Theory**
    - Considered personality to be an energy system
    - Psychic energy – generated by instinctual drives, this energy powers the mind and constantly presses for either direct or indirect release
        - Buildup of sexual energy can be discharged directly through sexual activity, or indirectly through fantasies or artistic depictions
    - Mental events are divided:
        - Conscious – events that we are presently aware of
        - Preconscious – memories, thoughts, feelings, images that we are unaware of at the moment, but can be recalled
        - Unconscious – dynamic realm of wishes, feelings, and impulses that lie beyond our awareness
    - Personality divided into three separate but interacting structures:
        - Id – primitive and unconscious part of the personality that contains the instincts
            - Operates according to the pleasure principle (seeks immediate gratification or release, regardless of rational considerations or reality)
        - Ego – executive of personality that is partly conscious between impulses of id, prohibitions of superego, and dictates of reality
            - Operates according to reality principle (tests reality to decide when the id can safely discharge impulses)
        - Superego – moral arm of personality that internalizes standards and values of society
            - Rewards compliance with pride, and non-compliance with guilt
    - Id and superego are formed when child is young, ego develops later
    - Iceberg analogy – id is below the water (unconscious), while ego and superego are mostly above water (conscious)
        - Ego is mostly above water, while superego has portions both above and under
    - Unconscious conflict – interaction of id, ego, and superego results in constant struggle, causing anxiety
        - Reality anxiety – ego's fear of real world threats
        - Neurotic anxiety – ego's fear of id's desires
        - Moral anxiety – ego's fear of guilt from superego
    - Defense mechanisms – unconscious processes by which the ego prevents the expression of anxiety-arousing impulses
        - Repression – ego uses some of its energy to prevent anxiety-arousing memories from entering consciousness
        - Sublimination (displacement) – completely masking the sinister underlying impulses through other forms (art, sports, etc.)
        - Rationalization – urge reinterpreted in acceptable terms
        - Projection – own urges seen in others ("I hate you" becomes "You hate me")
        - Isolation – memories allowed back into consciousness without motives or emotions
        - Regression – mentally returning to an earlier, safer state

        - Conversion – conflict converted into physical symptom (developing blindness so as not to see an anxiety-arousing situation)
    - Psychosexual stages – stages of development in which psychic energy is focused on certain body parts
        - Oral (0-2), Anal (2-3), Phallic (4-6), Latency (7-puberty), Genital (puberty+)
        - Deprivation or overindulgences in a stage can result in fixation, in which instincts are focused on a particular theme
        - Oedipus complex – the male child experiences erotic feelings toward his mother and views his father as a rival (female's complex referred to as Electra complex)
- **Evaluating Psychoanalytic Theory**
    - Alfred Adler insisted that humans are social beings who are motivated by social interest (the desire to advance the welfare of others)
    - Carl Jung developed analytic psychology
        - Humans not only posses a personal unconscious of life experiences, but a collective unconscious of memories accumulated throughout the history of humanity
        - Memories are represented by archetypes, inherited tendencies to interpret experience in certain ways
    - Object relations – the images or mental representations that people form of themselves and other people as a result of early experience with caregivers

<u>The Humanistic Perspective</u>

- Self-actualization – the total realization of one's human potential
- **Carl Rogers's Self Theory**
    - Self – an organized, consistent set of perceptions of and beliefs about oneself
        - Must have self-consistency (absence of conflict among self-perceptions) and congruency (consistency between self-perceptions and experiences) to maintain self-concept
        - Experiences that are inconsistent with self-concept evokes threat and anxiety
    - People are born with a need for positive regard (acceptance, sympathy, and love)
        - Unconditional positive regard – communicated attitude of total and unconditional acceptance of another person
        - Conditional positive regard – dependant on behaviour of the child
        - Need for positive self-regard develops
        - Lack of unconditional positive regard leafs to belief that they are worthy of love only when standards are met
            - Fosters development of conditions of worth that dictate when we approve or disapprove of ourselves
    - Fully functioning persons – self-actualized people who are free from unrealistic conditions of worth and who exhibit congruence, spontaneity, creativity, and a desire to develop further
- **Research on the Self**
    - Self-esteem – how positively or negatively we feel about ourselves
        - Children develop high self-esteem when parents communicate unconditional acceptance and love, establish clear guidelines for behaviour, and reinforce compliance while giving the child freedom to make decisions
    - Self-verification – a need to preserve self-concept by maintaining self-consistency and congruency
    - Self-enhancement – processes whereby one enhances positive self-regard
    - Gender schemas – organized mental structures that contain our understanding of the attributes and behaviours that are appropriate and expected for both genders

<u>Trait and Biological Perspectives</u>

- Factor analysis – statistical technique that permits a researcher to reduce a large number of measures to a small number of clusters or factors

    - Factor of introversion includes not attending parties, enjoying solitary activities, etc.
- Raymond B. Cattell developed 16 basic behaviour clusters of personality
- Hans Eysenck proposed two basic dimensions of personality
    - Introversion-Extraversion and Stability-Instability
    - Added third factor called Psychoticism (creativity, impulsivity, social deviance) – Self Control
    - Linked dimensions to differences in normal patterns of arousal in brain
        - Claimed introverts to be overaroused
- Big Five factor model proposes that openness, conscientiousness, extraversion, agreeableness, and neuroticism are principle factors of personality
- Mershon and Gersuch found that theories with more traits (such as Cattell's) are better at predicting specific behaviours
- Traits found to be both stable and changing
    - Introversion-extraversion, emotionality, and activity level are quite stable
    - Stability found in optimistic or pessimistic view to negative life events
- Three factors cause difficulty in prediction on basis of personality traits' relation to behaviour
    - Traits interact with other traits and characteristics in different situations
    - Degree of consistency across situations is influenced by how important a given trait is for a person
    - People differ in tendency to tailor behaviour to what is called for by the situation
        - Self-monitoring – personality trait that reflects people's tendencies to regulate social behaviour in accord with situational cues as opposed to internal values, attitudes, and needs

<u>Social Cognitive Theories</u>

- Social cognitive theorists combine behavioural and cognitive perspectives into an approach to personality that stresses the interaction of a thinking human with a social environment that provides learning experiences
    - Take into account both internal and external factors
- Reciprocal determinism – two way causal relations between the person, behaviour, and the environment
- **Julian Rotter: Expectancy, Reinforcement Value, and Locus of Control**
    - Likelihood that we engage in a particular behaviour in a given situation is influenced by two factors: expectancy and reinforcement value
        - Expectancy – perception of how likely that certain consequences will occur if we engage in a particular behaviour
        - Reinforcement value – how much we desire or dread the outcome that we expect
    - Internal-external locus of control – generalized expectancy that one's outcomes are under personal versus external control
- **Albert Bandura: Social Learning and Self-Efficacy**
    - Self-efficacy – beliefs concerning their ability to perform the behaviours needed to achieve desired outcomes
        - Key factor in way people regulate their lives
    - Four different determinants of self-efficacy:
        - Performance attainments in similar situations
        - Observational learning (if another person similar to yourself can accomplish a certain goal, so can you)
        - Verbal persuasion
        - Emotional arousal (anxiety or fatigue tend to decrease self-efficacy)

<u>Personality Assessment</u>

- **Interviews**
    - Should not limit attention to what interviewee says, but also how they say it
    - Characteristics of interviewer and interviewee can affect validity of information
- **Behaviour Assessment**

    - Psychologists devise an explicit coding system that contains the behavioural categories of interest
    - Psychologists observe behaviours rather than ask people about them
- **Remote Behaviour Sampling**
    - Researchers collect samples of behaviour from respondents as they live their daily lives
    - A beeper sounds at determined times throughout the day, and people record thoughts, feelings, etc.
- **Personality Scales**
    - Certain tests have validity scales that detect tendencies to respond in a socially desirable manner
    - Items on personality scales are developed in two ways:
        - Rational approach – items are based on theorist's conception of the personality trait to be measured
        - Empirical approach – items are chosen not because their content seems relevant to the trait, but because previous research has shown that the items were answered differently by groups of people known to differ in the personality characteristic of interest
            - Used to develop Minnesota Multiphasic Personality Inventory
- **Projective Tests**
    - Assumption is that when a person is presented with an ambiguous stimulus whose meaning is not clear, the interpretation attached to the stimulus will have to come partly from within
    - Rorshach inkblot test consists of ten inkblots of ambiguous shape
    - Thematic Apperception Test consists of series of pictures from paintings, drawings, and magazines
        - Respondents must describe what is going on in each scene

Chapter 13 – Psychological Disorders

Historical Perspectives on Psychological Disorders

- **The Demonological View**
  - Abnormal behaviour was claimed to be work of the devil
  - Procedure called trephination drilled hole in skull to release evil spirits
- **Early Biological Views**
  - Hippocrates suggested that mental illnesses are diseases just like physical disorders
  - Believed that site of illness was the brain
  - Biological emphasis increased after discovery that general paresis (mental deterioration disorder) resulted from brain deterioration
- **Psychological Perspectives**
  - Freud believed that psychological disorders are caused by unresolved conflicts
    - Disorders that don't involve a loss of contact with reality (obsessions, phobias, etc.) called neuroses
    - Severe disorders involving a withdrawal from reality called psychoses
  - Vulnerability-stress model – everyone has some degree of vulnerability to developing a disorder
    - Vulnerability can have biological basis, brain malfunction, or hormonal factor
    - Can also arise from personality factors such as low self-esteem
    - Vulnerability often only causes disorder when a stressor combines with it to trigger the appearance of the disorder

Defining and Classifying Psychological Disorders

- **What is "Abnormal"?**
  - Three criteria seem to govern decisions about abnormality:
    - Distressing – we are likely to label behaviours abnormal if they intensely distress an individual
    - Dysfunctional – most behaviours that are abnormal are dysfunctional for the individual or society
    - Deviance – abnormality of a behaviour is based on society's judgments of the deviance of it
  - Abnormal behaviour – behaviour that is personally distressful, personally dysfunctional, and/or culturally deviant
- **Diagnosing Psychological Disorders**
  - Classification must be set up that meets standards of reliability (high levels of agreement in decisions among clinicians) and validity (diagnostic categories accurately capture the essential features of disorders)
  - Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) most widely used diagnostic system
    - Allows diagnostic information to be represented along five dimensions:
      - Axis I – person's primary clinical symptoms
      - Axis II – long-standing personality or developmental disorders that could influence behaviour and response to treatment
      - Axis III – physical conditions that might be relevant
      - Axis IV – intensity of environmental stressors
      - Axis V – person's coping resources
- **Critical Issues in Diagnostic Labeling**
  - Diagnoses can have important legal consequences
  - Law tries to take into account the mental status of individuals accused of crimes
    - Competency – defendant's state of mind at time of a judicial hearing (not during committing of crime)
    - Insanity – presumed state of mind of defendant at time of crime

Anxiety Disorders

- Anxiety disorders – group of behaviour disorders in which anxiety and maladaptive behaviours are core of the disturbance
    - Frequency and intensity of anxiety responses are out of proportion to situation that triggered them
- Have four components:
    - Subjective-emotional component (feelings of tension and apprehension)
    - Cognitive component (feeling of inability to cope, sense of impending danger)
    - Physiological responses (increased heart rate and blood pressure, muscle tension)
    - Behavioural responses (avoidance of certain situations and impaired task performance)
- **Phobic Disorder**
    - Phobias – strong and irrational fears of certain situations or objects
        - Most common include agoraphobia (fear of open and public spaces), social phobias, and specific phobias (dogs, snakes, spiders, etc.)
- **Generalized Anxiety Disorder**
    - Generalized anxiety disorder – a chronic state of diffuse, or "free-floating", anxiety that is not attached to specific situations or objects
- **Panic Disorder**
    - Panic disorders – anxiety disorder characterized by unpredictable panic attacks and a fear that another will occur
        - Much more intense than generalized anxiety disorder
    - Many people develop agoraphobia because of fear that they will have an attack in public
- **Obsessive-Compulsive Disorder**
    - Anxiety disorder characterized by persistent and unwanted thoughts and compulsive behaviours
        - People realize obsessions and compulsions have no value, and want to stop
    - Obsessions – repetitive and unwelcome thoughts, images, or impulses that invade consciousness
    - Compulsions – repetitive behavioural responses that are difficult to resist
    - Genetic link found with Tourette's, childhood disorder characterized by muscular/vocal tics, facial grimacing, vulgar language
        - Increased activity in frontal lobes, decreased serotonin activity
- **Post-Traumatic Stress Disorder**
    - A pattern of distressing systems (flashbacks, nightmares, etc.) an anxiety responses that recur after a traumatic experience
    - Four major symptoms:
        - Person experiences severe symptoms of anxiety, arousal, and distress
        - Person relives the trauma in recurrent flashbacks, dreams, and fantasies
        - Person becomes numb to world and avoids stimuli that serves as reminder of the trauma
        - Personal experiences "survivor guilt" in instances where others were killed
- **Causal Factors in Anxiety Disorders**
    - Genetic factors may create a vulnerability to anxiety disorders
        - Abnormally low levels of GABA activity may cause people to have highly reactive nervous systems that quickly produce anxiety responses in response to stressors
        - Biological preparedness makes it easier to learn to fear certain stimuli, and may explain why phobias seem to centre on certain classes of primal stimuli and not on more dangerous modern ones, such as guns
    - Anxiety is central feature of psychoanalytic conceptions of abnormal behaviour
        - Neurotic anxiety – state of anxiety that arises when impulses from the id threaten to break through into behaviour
            - Form of anxiety disorder determined by how ego's defense mechanisms deal with neurotic anxiety
    - Cognitive theorists stress role of maladaptive thought patterns and beliefs in anxiety disorders

        - Eliciting stimuli physiological responses catastrophic appraisals panic attack
    - Behavioural perspective believes anxiety disorders result from emotional conditioning
    - Culture-bound disorders – behaviour disorders whose specific forms are restricted to one particular cultural context

Mood (Affective) Disorders

- Mood disorders – psychological disorders whose core conditions involve maladaptive mood states
- **Depression**
    - Major depression – mood disorder characterized by intense depression that interferes markedly with functioning
    - Dysthymia – a depressive mood disorder of moderate intensity that occurs over a long period of time but does not disrupt functioning as a major depression does
    - Depression involves cognitive symptoms, motivational symptoms, and somatic (physical) symptoms
- **Bipolar Disorder**
    - Bipolar disorder – depression alternates with periods of mania
        - Mania – state of highly excited mood and behaviour that is quite the opposite of depression
        - Norepinephrine drops during depression, increases during mania
- **Prevalence and Course of Mood Disorders**
    - People born after 1960 are ten times more likely to experience depression than are their grandparents
    - Women are twice as likely to suffer from depression
    - After depression, one of three patterns may follow:
        - Half of all cases, depression will never recur
        - Many people show recovery with recurrence some years later (recurring episode is shorter)
        - About ten percent will not recover
- **Causal Factors in Mood Disorders**
    - Genetic and neurochemical factors are linked to depression
    - Manic disorders may stem from overproduction of neurotransmitters that are underactive in depression
    - Psychoanalysts believe that early traumatic experiences create vulnerability for depression
    - Lewinsohn claims a loss of rewards leads to mood disorders
    - Martin Seligman suggested that overemphasis on individual attainment and lesser commitment to traditional values are likely to react strongly to failure and cause depression
        - Learned helplessness theory – depression occurs when people expect that bad events will occur and that nothing can be done to prevent or cope
    - Depressive cognitive triad (Beck) – triad of negative thoughts that depressed people cannot control or suppress
        - Triad includes the world, oneself, and the future
    - Depressive attributional pattern – tendency of depressed people to attribute negative outcomes to their own inadequacies and positive ones to factors outside of themselves
    - Cultural factors affect ways in which depression is manifested
        - Depression more commonly reported in western nations
        - Feelings of guilt and personal inadequacy in western nations, physical symptoms in African nations

Somatoform Disorders

- Somatoform disorders – a disorder in which a person complains of bodily symptoms that cannot be accounted for in terms of actual physical damage or dysfunction

    - Hypochondriasis – people become unduly alarmed about any physical symptom they detect, and are convinced they are about to have a serious illness
    - Pain disorder – people experience intense pain that either is out of proportion to whatever medical condition they might have or for which no physical basis can be found
    - Conversion disorder – serious neurological symptoms, such as paralysis, loss of sensation, or blindness suddenly occur
        - People often exhibit a lack of concern about their symptoms (la belle indifference)
        - Glove anaesthesia, in which person loses sensation below wrist, is physiologically impossible, since nerves also serve area above the hand
- Differ from psychophysiological disorders, which cause a real medical condition

<u>Dissociative Disorders</u>

- Dissociative disorders – disorders which involve a major dissociation of personal identity or memory
- Take on three different forms:
    - Psychogenic amnesia – a person responds to a stressful event with extensive but selective memory loss
    - Psychogenic fugue – a person loses all sense of personal identity, gives up their customary life, wanders to a new faraway location, and establishes a new identity
        - Triggered by a highly stressful event or trauma
        - May last from several hours to several years
    - Dissociative identity disorder – two or more separate personalities coexist in the same person
        - A primary/host personality appears more often than others
        - Personalities may or may not know of existence of others
        - Can differ in gender, age
        - Trauma-dissociation theory – development of new personalities occurs in response to severe stress

<u>Schizophrenia</u>

- Schizophrenia – a psychotic disorder that involves severe disturbances in thinking, speech, perception, emotion, and behaviour
    - Literally means "split mind"
- **Characteristic of Schizophrenia**
    - Diagnosis requires that a person misinterprets reality and exhibits disordered attention, thought, and perception
    - Delusions – false beliefs that are sustained in the face of evidence that normally would be sufficient to destroy them
    - Hallucinations – false perceptions that have a compelling sense of reality
    - Emotions can be affected in several ways:
        - Some have blunted affect, manifesting less emotion that others
        - Some have flat affect, showing almost no emotion at all
        - Some have inappropriate affect, expressing a wrong emotion to a situation
- **Subtypes of Schizophrenia**
    - Four major subtypes of schizophrenia:
        - Paranoid type – people believe that others mean to harm them, and delusions of grandeur, in which they believe they are enormously important
        - Disorganized type – central features are confusion and incoherence, together with severe deterioration of adaptive behaviour
        - Catatonic type – shows striking motor disturbances, ranging from muscular rigidity to random or repetitive movements
        - Undifferentiated type – exhibit some symptoms and thought disorders of other categories, but not enough to be diagnosed in a category
    - Two main categories on basis of two classes of symptoms:

        - Type I schizophrenia – predominance of positive symptoms (delusions, hallucinations, and disordered speech)
            - Called positive because they represent pathological extremes of normal processes
        - Type II schizophrenia – predominance of negative symptoms (lack of emotional expression, loss of motivation, and absence of normal speech)
- **Causal Factors in Schizophrenia**
    - Strong evidence for a genetic predisposition, though specific genes are still unknown
    - Can be caused by destruction of neural tissue
        - Mild to moderate brain atrophy often observed
    - Dopamine hypothesis – symptoms of schizophrenia are produced by overactivity of dopamine system in areas that regulate emotional responses, motivated behaviour, and cognitive functioning
    - Freud believed that schizophrenia represented an extreme example of defense mechanism regression
    - Hospitalized schizophrenics are more likely to relapse if they return to a home environment that is high in a factor called expressed emotion (high levels of criticism, hostility, and overinvolvement)
    - Social causation hypothesis attributes higher prevalence of schizophrenia to higher levels of stress that low income people experience
    - Social drift hypothesis proposes that as people develop schizophrenia, their personal and occupational functioning deteriorates, so they drift down the socio-economic ladder into poverty
    - Prevalence is not different throughout cultures, though chance of recovery is greater in developed countries

<u>Personality Disorders</u>

- Personality disorders – stable, inflexible, and maladaptive personality styles
- **Anti-Social Personality Disorder**
    - Seem to lack a conscience
    - Display a perplexing failure to respond to punishment
- **Causal Factors**
    - Has genetic and physiological factors
    - Psychodynamic theorists claim people lack conscience due to underdeveloped superego
    - Poorer emotional classical conditioning found in those with anti-social disorder

<u>Disorders of Childhood and Old Age</u>

- **Childhood Disorders**
    - Externalizing disorders – directed toward the environment in the form of behaviours that are disruptive and often aggressive
        - Attention-deficit/hyperactivity disorder (ADHD) – problems take form of attentional difficulties, hyperactivity-impulsivity, or a combination of the two that results in impaired functioning
            - Much more common in boys
        - Oppositional defiant disorder (ODD) – children consistently behave in a disobedient, defiant, and hostile manner
        - Conduct disorder – children violate important social norms and show disregard for others
    - Internalizing disorders – involve maladaptive thoughts and emotions
- **Dementia in Old Age**
    - Dementia – the gradual loss of cognitive abilities that accompanies brain deterioration and interferes with normal functioning
    - Progressive atrophy of brain tissue occurs
    - Can occur at any point in life, but elderly are at greater risk
    - If began after age 65, called senile dementia

- Alzheimer's dementia – leading cause of dementia in elderly, accounting for 60% of senile dementias

Chapter 14 – Treatment of Psychological Disorders

- Mental health professionals fall into several categories:
    - Counseling and clinical psychologists – typically hold a Ph.D. or Psy.D.
    - Psychiatrists – medical doctors who specialize in psychotherapy and biomedical treatments
    - Therapist, counselor, psychotherapist, hypnotist are NOT protected terms
- APA membership: 29% eclectic (combined), 21% psychodynamic, 16% behavioural, 13% cognitive, 12% humanistic, 9% other

<u>Psychodynamic Therapies</u>

- **Psychoanalysis**
    - Goal is to help clients achieve insight (conscious awareness of psychodynamics that underlie their problems)
    - Free association – procedure of verbalizing all thoughts that enter consciousness without censorship
        - Freud sat out of sight from patient so thought processes would be determined by internal factors
    - Dream interpretation through free association of dream elements
    - Resistance – defensive maneuvers that hinder the process of therapy
    - Transference – psychoanalytic phenomenon in which a client responds irrationally to the analyst as if he were an important person from the client's past who plays an important role in the client's dynamics
        - Positive transference occurs when a client transfers intense affection, dependency, or love to the analyst
        - Negative transference occurs when a client transfers expressions of anger, hatred, or disappointment to the analyst
    - Interpretation – any statement by the therapist intended to provide the client with insight into their behaviour or dynamics
- **Brief Psychodynamic Therapies**
    - Clients seen a few times a week, rather than daily
    - Focus on current life situations, rather than on past childhood experiences
    - Interpersonal therapy – form of brief therapy that focuses on the client's interpersonal problems and seeks to develop new interpersonal skills

<u>Humanistic Psychotherapies</u>

- **Client-Centred Therapy**
    - Most important part of therapy is relationship that develops between client and therapist
    - Three important and interrelated therapist attributes:
        - Unconditional positive regard – therapists show clients that they genuinely care about them and accept them, without judgment or evaluation
        - Empathy – willingness and ability to view the world through the client's eyes
            - Therapist communicates understanding by reflecting back to client what they are communicating
            - Therapist cannot fake it, because client will realize this
        - Genuineness – therapist must honestly express his or her feelings, whether positive or negative
    - Non-directive approach (only person who can cure the client is client themselves)
- **Gestalt Therapy**
    - Term "gestalt" refers to perceptual principles through which people actively organize stimulus elements into meaningful "whole" patterns
        - Goals of therapy is to bring background figures into immediate awareness so that client can be "whole" again
    - Empty-chair technique involves client carrying on a conversation with his mother, where he alternately plays his mother and himself

Cognitive Therapies

- **Ellis's Rational-Emotive Therapy**
  - Therapy is embodied in ABCD model:
    - Activating event – triggers the emotion
    - Belief system – underlies way in which a person appraises the activating event
    - Consequences – emotional and behavioural consequences of the appraisal
    - Disputing – challenging an erroneous belief system
  - People are accustomed to viewing emotions (consequences) as being caused directly by activating events
    - Emotions are actually caused by belief system, which must be countered and altered
- **Beck's Cognitive Therapy**
  - Goal is to point out errors of thinking and logic that underlie emotional disturbances and to reprogram client's automatic negative thought patterns
  - Self-instructional training – cognitive coping approach of giving adaptive self-instructions to oneself at crucial phases of the coping process

Behaviour Therapies

- **Classical Conditioning Treatments**
  - Most direct way to reduce a phobia is through process of classical extinction of anxiety response
    - Requires exposure to feared CS in absence of UCS while using response prevention (prevention of escape or avoidance responses during exposure so that extinction can occur)
    - Client may be exposed to real-life stimuli (flooding) or may be asked to imagine scenes involving the stimuli (implosion)
  - Systematic desensitization – attempt to eliminate anxiety using counterconditioning, in which a new response that is incompatible with anxiety is conditioned to the anxiety-arousing CS
    - Client must construct a stimulus hierarchy (a series of anxiety-arousing stimuli that are ranked in terms of amount of anxiety they evoke)
    - Client must relax, and then focus on first level of hierarchy, then next, until finished
      - Client can't experience anxiety if relaxed strongly enough
      - Relaxation replaces anxiety as the CR
    - In vivo desensitization – exposure to a hierarchy of real life situations
  - Aversion therapy – therapist pairs a stimulus that is attractive to a person (and that stimulates deviant or self-defeating behaviour – the CS) with a noxious UCS in an attempt to condition an aversion to the CS
    - Example: to treat alcoholics, injecting the client with a drug that causes nausea upon consumption of alcohol
- **Operant Conditioning Treatments**
  - Behaviour modification – treatment techniques that involve the application of operant conditioning procedures in an attempt to increase or decrease a specific behaviour
  - Token economy – system for strengthening desired behaviours through the systematic application of positive reinforcement
    - Tokens rewarded upon observing desired behaviours, and are then traded in for various privileges
  - Therapists only use punishment after asking two important questions:
    - Are there alternative, less painful approaches that might be effective?
    - Is the behaviour to be eliminated sufficiently injurious to the individual or society to justify the severity of the punishment?
- **Modelling and Social Skills Training**

- Social skills training – clients learn new skills by observing and then imitating a model who performs a socially skillful behaviour

Integrating and Combining Therapies

- Increasing clinicians are becoming eclectic (combining treatments and making use of orientations and techniques that seems appropriate to the client)
- Psychodynamic behaviour therapy – an integration of psychoanalysis and behaviour therapy

Cultural and Gender Issues in Psychotherapy

- **Cultural Factors in Treatment Utilization**
  - Utilization of mental health services is far less for minority groups than it is for the majority white population
    - Psychologists have identified several barriers that cause this:
      - Cultural norm against turning to professionals outside of one's own culture for help
      - Inability to afford therapy
      - Too few skilled counselors who can provide culturally responsive forms of treatment
  - Culturally competent therapists – therapists who are able to use knowledge of the client's culture to achieve a broad understanding of the client

Evaluating Psychotherapies

- Specificity question – Which types of therapy, administered by which kinds of therapists to which kinds of clients having which kinds of problems, produce which kinds of effects?
- **Psychotherapy Research Methods**
  - Hans Eysenck countered the assumption that without therapy, patients would not improve
    - Concluded that rate of spontaneous remission (symptom reduction in absence of treatment) was as high as success rates reported by psychotherapists
    - Came to conclusion that troubled people are equally likely to improve, with or without therapy
    - APA has now found effective therapies for specific disorders
  - Most psychotherapy researchers favour randomized clinical trials (research design that involves random assignment of clients with specific problems to an experimental group or control condition so as to draw sound conclusions about the therapy's efficacy
    - Placebo control group – gets an intervention that is not expected to work, but controls for client expectation of improvement
  - Meta-analysis – statistical procedure for combining results of different studies that examine the same topic
    - Effect size statistic – measure of treatment effectiveness that indicates percentage of treated clients that improve more than average untreated client
    - Dodo bird effect – effect that widely differing therapies all are effective
    - Clinical significance – requires that for a treatment to be successful, a patient can no longer fall within the range of having a psychological disorder
      - Example: even if a deeply depressed person becomes significantly less depressed over the course of treatment, but still falls in the range of depression, the treatment is not considered successful
- **Factors Affecting the Outcome of Therapy**
  - Three factors influence the outcome of the treatment:
    - Openness – clients' willingness to invest themselves in therapy and take risks required to change
    - Self-relatedness – ability to experience and understand internal states such as thoughts and emotions, to be attuned to processes in relationship with their therapist, and ability to apply what they learn in therapy to lives outside of treatment
    - Nature of the problem – how appropriate the therapy is to treat the disorder

- Quality of relationship between therapist and client is important determinant of outcome
  - Hostile interchanges between client and therapist can lead to deterioration effect
- Dose-response effect – relation between amount of treatment received and quality of outcome
- Most patients do not remain in therapy long enough to realize potential benefits (average of 5 sessions with 20% improvement)
- Experts have found common factors that contribute to therapy success:
  - Faith in therapist and belief on client's part that they are receiving help
  - Plausible explanation for their problems, and alternative way of looking at themselves with their problems
  - Protective setting in which clients can experience and express deepest feelings
  - Opportunity to practice new behaviours
  - Increased optimism and self-efficacy

<u>Biological (Somatic) Approaches to Treatment</u>

- **Drug Therapies**
  - Anti-anxiety drugs designed to reduce anxiety without affecting alertness or concentration
    - One drawback is psychological and physical dependence
    - Newer drug called buspirone is slow acting, has fewer fatiguing side effects, and has less potential for abuse
      - Slows down excitatory synaptic activity by affecting GABA
  - Antidepressant drugs fall into three major categories:
    - Tricyclics – increase activity of excitatory neurotransmitters norepinephrine and serotonin
      - Prevent reuptake of transmitters
    - Monoamine oxidase inhibitors – same effect as tricyclics through different method
      - Reduces activity of monoamine oxidase, an enzyme that breaks down the neurotransmitters
      - Can cause dangerous elevations in blood pressure when taken with certain foods
    - Selective serotonin reuptake inhibitors – increases activity of only serotonin
      - Many patients experience nervousness, insomnia, sweating, joint pain, or sexual dysfunction
      - Gradually replacing tricyclics because of milder side effects and more rapid reducing of depressive symptoms
  - Antipsychotic drugs have allowed severely disordered people to leave the hospital setting
    - Reserpine, drug from root of snakeroot plant, found to calm psychotic patients
    - Synthetic antipsychotic drugs (major tranquilizers) used to treat schizophrenic disorders
      - Primary effect is to decrease action of dopamine
      - Have dramatic effect in reduction of positive symptoms, but little effect on negative symptoms
    - Tardive dyskinesia – an irreversible motor disorder that can occur as a side effect of certain antipsychotic drugs
    - New drug called clozapine reduces both positive and negative symptoms
- **Electroconvulsive Therapy**
  - Biomedical technique involving application of electrical current to brain, primarily used to reduce severe depression
    - Cannot relieve anxiety disorders, and is of questionable value for schizophrenics
  - Based on observation that schizophrenia and epilepsy rarely occur in the same person
  - Patient is given a sedative and muscle relaxant to prevent injuries from convulsions
- **Psychosurgery**

- Refers to surgical procedures that remove or destroy brain tissue to change disordered behaviour
  - Least used of biomedical procedures
- Egas Moniz reported that cutting nerve tracts connecting frontal lobes with subcortical areas of brain involved in emotion resulted in calming of violent patients
  - Follow up research found that lobotomy caused seizures, memory impairment, and other side effects
- Cingulotomy – involves cutting a small fibre bundle near the corpus collosum that connects the frontal lobes with the limbic system
  - Seems effective in treating OCD

Psychological Disorders and Society

- **Deinstitutionalization**
  - In 1960s, concern about inadequacies of mental hospitals, and ability of antipsychotic drugs to normalize patient's behaviour, led to movement to transfer primary focus of treatment from institution to community
  - Psychiatric units were added to many hospitals and community services were established
  - Revolving door phenomenon – patients respond well to medication in hospital, and are soon released into a community that cannot offer them care they require, and then are sent back to the hospital
- **Preventive Mental Health**
  - Preventing development of disorders is preferable to successful treatment
  - Two perspectives can prevent disorders:
    - Situation-focused prevention – directed at reducing or eliminating environmental causes of behaviour disorders or at enhancing situational factors that help prevent the development of disorders
    - Competency-focused prevention – designed to increase personal resources and coping skills