Chapter 1

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Psychology 1000 Chapter 1 Notes

Discovery of Brain-Behaviour Relations

- Luigi Galvani performed an experiment with frog leg and electricity and discovered that brain signals were electrical in nature
- Karl Lashley created lesions in specific parts of the brain to study its effect on memory and learning
- James Olds and Peter Milner of McGill University discovered that certain areas of the brain gave animals pleasurable sensations
- EEG (1929) allowed researchers to measure brain activity in certain areas of the brain
- Biochemical research shows that the brain's electrical activity is controlled by chemicals released by nerve cells
    - These are known as **neurotransmitters**

Evolution and Behaviour: From Darwin to Evolution Psychology

- Humans exist because of our ancestor's ability to adapt to a changing, hostile environment

Darwin's Evolutionary Theory

- Darwin proposed that species evolve over time as a response to environmental conditions in a process called **natural selection**
- Any inheritable characteristic that enhances survival will be maintained
- His work was inspired by a 5 year trip to South America and was published in his book **On the Origin of Species**

Modern Evolutionary Psychology

- An organism's biology determines its behavioural capabilities and its behavior
- One theory is that evolutionary pressures force human beings to learn, think, reason, and socialize more effectively
- **Sociobiology,** however, states that complex social behaviours are also built into the human species as a product of evolution
    - It states that behavior that likens the chance of passing on offsprings are also favored
        - This includes aggression, competition, and dominance in males
- Altruism serves a greater purpose of passing on one's genes are it is difficult for women to reproduce often during their lifetime

Behaviour Genetics

- Behaviour genetics is the study of how behvaioural tendencies are influenced by genetic factors
    - Eg. Fighting fish are bred by mating very bright and aggressive pairs
    - Eg. Identical twins have similar behavior compared to fraternal twins

Cognitive Perspective:

- The viewpoint where humans are problem solvers whose actions are governed by thoughts and planning
- Concerned with how information is perceived and organized in our minds

Origins of the Cognitive Perspective

- **Titchener** and **Wundt** approach was known as **Structuralism** because they analyzed the mind in

terms of its basic elements

- They believed that **sensations** are the basic elements of consciousness, and they studied it by using **introspection**
- Structuralism eventually died out and gave way to **functionalism,** which studies the functions of consciousness
- **Gestalt psychology** was concerned with how elements of experience are organized into a whole
    - it argues that the sum of all perceptions is greater than and different from the individual parts
    - Kohler is a leader in this field, and studied Animals on the Canary Islands during WWI
    - He concluded that the ability to perceive relationships is the essence of intelligence and that **insight** is the perception of a useful relationship or solution to a problem (an a-HA moment)
        - Eg. Kohler placed a banana out of reach of an ape, but put a box near the ape. The ape figured out how to use the box to reach the banana.

Piaget: Cognitive development in children

- Piaget spent 50 years studying how children think, reason, and solve problems
- Piaget concluded that new and specific stages of cognitive development unfold naturally as children mature

Cognitive approaches to psychological disorders

- Albert Ellis and Aaron Beck tried to understand how mental distortions and irrational thoughts patterns create emotional problems
- Distress and maladaptive behavior is not only caused by external factors but by the way we think about the situations

Modern Cognitive Science

- **Artificial intelligence** develops computer models of complex human thought, reasoning, and problem solving
- By creating models that duplicate natural cognitive process, a better understanding of how humans think can be gained
    - Eg. There are computerized medical diagnostic systems that are based on the thought process of eminent physicians
- **Hebb** wrote a book called *The organization of behavior: A neuropsychological theory*
    - Proposed a hypothetical brain structure called a “cell assembly” which states that repeated usage is associated in carrying out responses more effectively (practice makes perfect)

Social Constructivism

- Social Constructivism claims that a large part of what people consider reality is a large part of our mental creation
- A little part of **shared reality** exists

Psychodynamic Perspective: The Forces Within

- **Psychodynamic perspective** searches for the causes of behavior within the workings of our personality and the role of unconscious processes
    - **Eg.** Doing something out of character and something that you were not meaning to do in the first place

Psychoanalysis: Freud’s Great Challenge

- Freud emphasized the role of complex psychological forces that control human behavior
- He focused on the treatment of **hysteria,** a psychological disorder in which physical symptoms such as blindness, pain, or paralysis develop without any physical woes
    - He uses hypnosis and free association to treat his patients and his patients tell him about forgotten instances of childhood sexual abuse
- He concluded that his patients were prompted to create these fantasies by a compelling and unsatisfied sexual drive that is a universal aspect of human nature
- Freud believes that much of human behavior is influenced by forces which humans are unaware
- Freud claims that our childhood has a significant impact on our adult personalities

- Freud suspected that because some of our early sexual needs are punished, we learn to fear them and become anxious when we become aware of their presence
    - These anxieties are coped with through defense mechanisms
    - One of the most important is **repression**, which protects us by keeping impulses, feelings, and memories in the unconscious part of the mind
    - They remain there as a source of energy, striving for release
- Some of Freud's research was contradicted, and some others were validated
    - It helped stimulate the development of new theories as well as promote new research

Current Developments

- Scientists working within the biological perspective have identified brain mechanisms that can produce emotional reactions of which we are consciously unaware
- Cognitive scientists have shown that many aspects of information processing occur outside of our awareness

Behavioural Perspective: The Power of the Environment

- Focuses on the role of the external environment in shaping and governing our actions
- People's behavior is jointly determined by learned habits from their life experience or from their immediate environment

Origins of the Behavioural Perspective

- Behavioural perspective comes from a 17th century school of philosophy known as **British empiricism**
    - All ideas and knowledge are gained empirically (through the senses)
    - Humans are a blank sheet of paper and is differentiated by experience

Behaviourism

- **Behaviourism** is a school of thought that emphasizes environmental control of behavior through learning
- John B. Watson was against structuralists, functionalists, and psychoanalysts and argued that proper psychology should be based on **observable actions**
- Structuralists believe that one is only influenced by outside forces and not their innate tendencies
- Behaviourists do not focus on what's happening inside, but rather on what's happening outside
- B.F. Skinner was a famous behaviourist
- **Behaviour modification** is possible by altering the environmental factors that stimulate behavior

Cognitive Behaviourism

- **Cognitive Behaviourism** is an attempt to combine behavioural and cognitive perspectives to make a more comprehensive theory
- This theory states that the environment gives us the knowledge to behave effectively
    - Eg. If we see someone do something effective, we store it in our memory and use it for later

The Humanistic Perspective: Freedom and Self-Actualization

- Humanistic perspective emphasizes a person's innate tendencies toward growth and to find ultimate meaning in existence
    - It emphasizes the role of the internal thought process
- Humanists believe that every person strives toward **self-actualization** or reaching one's

personal potential

- **Terror management theory** states that an innate desire for continued life, combined with the uniquely human awareness of death, creates an existential terror
    - Cultures deal with it by usually creating an afterlife and creates a standard for personal value and some hope for transcending death
- People who live up to their culture's values have more self esteem and lower death anxiety

The Sociocultural Perspective: The Embedded Human

- This perspective focuses on the manner in which culture is transmitted to its members and on the similarities and differences that occur among people from diverse cultures
- **Culture** is values, beliefs, behaviours, and traditions that are shared by a large group of people and is passed on through generations
- Cultures create their own **norms** to what is expected and acceptable
- Humans have an inherent need to develop cultures to foster stability and predictability
    - In adherence to the **terror management theory**, this takes the pressure of individuals about many things

Cultural Learning and Diversity

- Mead studied 3 different tribes on New Guinea
    - Tribe 1 – men and women are very kind and sympathetic
    - Tribe 2 – men and women are fierce
    - Tribe 3 – Men and women have reversed roles that in Western society
- One of the major cultural differences is **individualism** vs **collectivism**
- Most developed North America and Northern European cultures promote individualism while in Asia and Africa, collectivism is more common

Perspectives in Historical Context

Refer to table 1.2 for comparison chart

- Psychology began with cognitive focus when Wilhem Wundt started the school of structuralism
- Functionalism began at the end of the 19th century in the United States
- Around the same time, Freud began the psychodynamic perspective
- 1920s were a period of dramatic change for psychology with the new school of behaviourism
    - Led by B.F. Skinner, behaviourism remained at the forefront of psychological thought in the 1960s
- In the Mid 1960s, a cognitive revolution happened and reawakening of interest in mental events happened
- Eventually, Behaviourists saw a need to incorporate cognition into their research

Integrating The Perspectives: Three Levels of Analysis

- Behaviour always involves a biopsychological person acting within an environment
- Everything psychological is at the same time biological
    - Eg. Hormones, genetics
    - However, this cannot tell us how different electrochemical activities within certain parts of the brain fit together
- A psychological perspective must also be taken into account
- The environment must also be taken into account which help shape and stimulate our behavior

Refer to Depression example on page 31

Summary of Major Themes

- As a science, psychology is empirical, it favors observation over intuition and reasoning

- Psychologists recognize that our experience of the world is subjective to our own reality
- Behaviour is determined by multiple causal factors that can interact with each other
- Nature and Nurture influence one another
- Behaviour is a means of adapting to environmental demands and psychological capacities have evolved accordingly to ensure survival
- Behaviour is strongly affected by the cultural environment

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Chapter 2: Incomplete

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Psychology 1000: Chapter 2 Notes

Scientific Principles in Psychology

- Science is about discover about the world guided by the scientific method
- Presents a challenge in behavioral science because it's difficult to quantitatively measure the mind

Scientific Attitudes

- Science is based on curiosity, skepticism, and open-mindedness
    - Eg. John Darley and Bibb Latane discussed how 38 bystanders did nothing as they witnessed a crime
        - They were unsatisfied by the "dehumanization produced by the urban environment" explanation
        - They concluded that having multiple bystanders produced a **diffusion of responsibility**

Gathering Evidence: Steps in the Scientific Process

- **Fig 2.2**
- First a question is asked about a phenomenon, and then a hypothesis is generated
- A **hypothesis** is a tentative explanation
    - It is asked in an If-then format
- After a hypothesis is generated, it must be tested through research
    - Darley and Latane created a false emergency in which subjects were led to believe that someone was seisuring
    - Subjects who thought there were other bystanders present took longer time to react
- The collected data is then analyzed to prove or disprove the hypothesis
- Then scientists try to build a **theory** to explain why certain events are related to each other
    - Latane combined the principle of diffusion of responsibility to other principles to develop a Theory of Social Impact
- Finally, the theory is used to develop new hypotheses

Two Approaches to Understanding Behavior

Hindsight Understanding

- Most common approach in understanding behavior is hindsight reasoning
- The problem with this method is that there are way too many possible explanations regardless of what happens
    - No way to determining if any of the alternatives is correct

Understanding through Prediction, Control, and Theory Building

- A good theory generates an integrated network of predictions
    - Incorporates existing facts and observations within a single broad framework
    - It is testable
    - Predictions made in theory are supported by future research
    - It conforms to the **law of parsimony**: if two theories explain and predict the same phenomena, the simpler one is preferred
- Even is a theory is supported by many successful predictions, it is never regarded as an absolute

truth because future findings may disprove it

Defining and Measuring Variables

- A **variable** is any characteristic that can differ
- Since many variables are non material (eg. Stress, intelligence), scientists develop an **operational definition**: which translates an abstract term into something observable and measurable
    - Eg. Measuring exam stress and academic performance
- Although not everyone will agree with the operational definition, it lets others know what is being tested

Self Report Measures

- It asks people to report on their own knowledge, beliefs, feelings, experiences, or behavior
- Depends on peoples willingness to respond honestly
- Subjects may be distorted by *social desirability bias*: the tendency to give a good impression rather than reflect on how they truly feel or behave
- To avoid this phenomena, questions can be designed to emphasize their positive qualities rather than their negative ones
- Alternatively, **over-claiming questionnaire** is used which uses nonexistent items to and the subjects familiarity with them to measure their honesty

Reports by Others

- We can learn about the subjects based on observation from witnesses

Physiological Measures

- Scientists can used heart rate, blood pressure, respiration rate, and hormonal secretions to measure what is happening to the subject
- However, how these physiological signs can be interpreted in many ways

Behavioral Observations

- This is to measure people’s overt (directly visible) behaviors
    - eg. Seeing how long it takes for bystanders to respond
- Other way is by using **archival measures** which is already existing records or documentation
    - Eg. Police reports for frequency of drunk driving occurences
- Humans act differently when they are observed
    - To counter this, researchers camouflage themselves or use unobtrusive measures to make sure the participants are unaware that they are observed
    - Eg. Seeing how many used condoms turned up in the sewer after a safe sex program was induced

Methods of Research

- 3 methods are used
    - **Descriptive method**: involving recording observations or surveys
    - **Correlational methods**: involve measuring the strength of association between two or more events
    - **Experimental methods**: involve manipulations to establish cause and effect relationships between two or more events

Descriptive Research

- Seeks to identify how humans and other animals behave
- May yield clues about potential cause-effect relationships that are later tested experimentally

Case Studies: Treating Cases of Failure to Thrive in Human Infants

- **Case study** is an in depth analysis of an individual, group, or event
- Case studies provide new ideas and hypotheses that may be tested
- Case study may challenge the validity of a theory or widely held scientific belief
    - Eg. Language must be learned through exposure at a young age. All you have to do to

disprove this is to find a single example where this is not the case
- It can illustrate effective intervention programs
    - Eg. The failure for babies to grow rapidly after birth can cause future physical and intellectual development
        - This is caused by poor parenting and poverty
        - Intervention program to train low IQ score moms who had failure to thrive babies on how to effectively feed their children
    - First is **baseline**: measuring the child's weight]
    - Following is **treatment:** 6 weeks of advice and supervision to the parents
    - Finally there is **followup:** where the child's weight is measured over the next 3 years
- Case studies have several limitations
    - Poor method of determining cause-effect relations
    - Will the generalizations found in the study be tested true for other cases and other situations
    - Some results are subject to the bias of the observer

Naturalistic Observation: Bullying and Victimization in Canadian Public Schools

- In **naturalistic observation**, the researcher observes behavior as it occurs in nature
    - Extensively used to study animals
    - Eg. Jane Goodall's study of chimps in Africa
        - Learned that they can use and make tools
- Does not permit causal conclusions about the relationship between variables
    - The observer may influence the behavior of the participants

Survey Research: Does your own personality match the Canadian national character?

- Survey research is information about a topic that is administered through questionaires or interviews
- Two concepts in survey research are **population** and **sample**
    - Population is all the individuals whom we are interested in drawing a conclusion from
    - A **sample** is a subset of individuals drawn from the larger population of interest
- To draw a valid conclusion, the sample must be **representative** which is one that reflects the important characteristics of the whole population
    - Generally, researchers try to keep the sample in the same proportions as the population
- Larger samples are generally better than smaller ones
- Unrepresentative samples will produce erroneous results
    - Eg. 1936 election, Literary Digest magazine did a survey with 2 million people that reported Landon was going to win, but Roosevelt won instead
        - This is because the sample was chosen from telephone registrations and automobile registrations which only the rich minority of Americans had
- One of the biggest survey advances came with the invention of the internet
    - Allowed quick collection of data in short time
    - However, there is less control over data quality because people can lie about stuff
    - There is more chance of bias because there is no method for randomly sampling the population of internet users
    - Internet, however, has a wide variety of people in different socioeconomic status, geographic region, age, and gender
- There are 3 major survey drawbacks
    1. Unrepresentative samples

2. Relies on the fact that people do not lie or misperceive their own behavior
3. Survey data cannot be used to draw data about cause and effect
4.

Wes's Chapter 2 Notes

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Chapter 2

When acting as a psychiatrist there are certain values that you must obtain to succeed as a scientist. The first is that you must be curious because without curiosity nothing would be discovered. Second most there must be skepticism because without skepticism there would be no need for reason. Finally, there must be open mindedness because without that a satisfactory answer may never be reached.

As well as these necessary qualities that psychiatrists must possess they must also follow a set of steps to prove something. The scientific process begins with an observation and a question about said observation. After this the conductor of the experiment must create a hypothesis, then test the hypothesis using research. Then after the research is collected it will be analyzed and supplementary research can be conducted after the analysis. Finally, another hypothesis will be formed based on the findings and this will become a theory.

The Hindsight understanding of behavior occurs after the fact. This is often the first hypothesis about a situation (Kitty Genevese).

When possible it is also best for scientists to determine what causes what. They can determine this by first making there predictions, then ensuring that they can control the setting and finally building a theory, which is built on an integrated network of predictions. A good theory will always have:

- It incorporates existing facts and observations under a single broad heading.
- It is testable and generates new hypotheses whose accuracy can be tested by gathering new evidence
- The predictions made in the theory are supported by the findings of new research
- It confirms to the law of parsimony where if two theories can explain and predict the same phenomena equally well then the simpler theory is the preferred one

Defining and Measuring Variables

A variable is a characteristic that can differ. Some variables can represent non-material concepts as in memory and personality. An operational definition defines a variable in terms of a specific procedure.

To determine if people are being honest during self reports Over-Claiming-Questionnaires (where people say how familiar they are with something) can be used. Twenty percent of the objects on the Questionnaire are non-existent and therefore if people say they are familiar with those items they are not being honest.

The measuring of variables comes down to being measured in four ways: either by self-report, reports by others, physiological measures, and behavioral observation.

Methods of Research

Descriptive Research: Recording Events

The descriptive method is used to try and identify how humans and animals behave especially when they are in their natural settings.

Case Studies

Case studies are used to gain general knowledge about a very specific target. It has many benefits including how they bring about vibrant new ideas and how they bring insight into diverse topics. Another advantage is how they may challenge widely held scientific belief. The final and third benefit is that they can illustrate effective intervention programs for the target group.

Naturalistic Observation

In this method a researcher will try and observe an individual in their natural setting. This is often the method chosen for studying animals in the wild. It can take a very long time before the human observer can blend into the surroundings enough to observe natural behavior.

Survey Research
Questions are released in the form of a survey and the culmination of many surveys help to develop generalities. It is important that when a whole population cannot be surveyed that a good representative sample is obtained where proportional people from different subgroups are surveyed in correlation with the population. Random surveying in then employed to ensure that no biases occur within the subgroups.

Correlation Research: Measuring Association Between Events

Correlation research takes two separate variables that one might believe are inter related and measures both separately. Then the researcher determines statistically whether or not the variables are related. In correlation research one must be willing to accept that X could cause Y, Y could cause X or that they could both cause each other, this is called a bi-directional causality problem. Other factors, Z, might even be the cause of both X and Y meaning that X and Y are in no way interrelated, this is called the third-variable problem (when it looks like X and Y are related but both variables are caused by a third, Z). This form of research can sometimes lead to incorrect conclusions because people do not consider the possible variations.

The Correlation Coefficient

This coefficient indicates the strength and direction of association between two variables. If both variables are high then the correlation is positive (taller and heavier) and if one is low and the other high the correlation is negative (job turnover and job satisfaction). The correlation is measured between positive and negative one, where the absolute value tells you the strength of the correlation.

Correlation as a Basis for Predictions

Although definitive answers cannot be reached using this method I does allow scientists to compare events where they cannot control the system (fetal alcohols effect of children) and also allows people to make predictions such as which grade level coming out of high school will yield the better student in university. These predictions are also used by insurance companies.

Experiments: Examining Cause and Effect

Experiments are a very good way to examine the cause and effect of something and are the most effective way of testing explanations of why phenomena occur.

The Logic of Experimenting

Experiments work on the grounds of manipulating a variable so that there are different conditions to test. The researcher then measures whether or not changing one variable impacts the other variable. Finally, the researcher tries to eliminate all other variables from the experiment by trying to reproduce the same environment and situation for every test.
When proceeding with an experiment the independent variable is the variable that is modified for each situation and the dependant variable is the variable that will hopefully be effected by the independent.
Random assignment takes away the possible biases of an experiment when using different subjects in both the control and in the experimental groups.
Counterbalancing is when half of the participants do one task first and the other half participates in the second task first, this eliminates possible added variables (like fatigue or boredom) if all participants perform all of the experimental tasks.
Single variable experimentation tests the effects of one independent variable on the

dependant variable. Multi variable experimentation looks at more then one independent variable and how each of them influence the same dependant variable (see page 66).

Experimental versus Descriptive/ Correlation Approaches

In experimental research the scientist actually manipulates one or more variable to determine whether or not they affect a certain behavior, however in descriptive or correlation research the variables are only measured. Experimental research is usually conducted in a lab whereas the two other forms usually occur in natural settings. Finally in descriptive and correlation approaches one cannot keep extraneous factors constant as one does in an experiment. (see pg 69 for all advantages and disadvantages)

Threats To the Validity of Research

Internal Validity is how well an experiment supports a clear casual conclusion. If variables are not manipulated properly in a well-plotted experiment there may be some question as to which independent variable effects the dependant.

Confounding of Variables

This means that two variables are intertwined to make it impossible to tell which is influencing the dependant variable. The confounding variable is the variable that is not sought after (ex Mozart music make you perform better, mood is confounding variable because Mozart makes you more relaxed). Confounding is the reason that conclusions cannot be drawn from correlation research.

Demand Characteristics

These are certain traits that participants pick up while trying to fulfill cues about the hypothesis. When a participant picks up subtle clues about how they are supposed to react to situations they ruin the validity of the experiment because it distorts the participants true response.

Placebo Effect

In medical research if both the half receiving the true drug and the placebo show improved conditions there is a high placebo effect. This is bad because it introduces the variable of expectation. The placebo effect decreases the validity of an experiment because the variables of expectation and chemical reactions have been confounded.

Experimenter Expectancy Effect

This refers to the subtle ways that researchers might portray to their participants what they want the outcome to be. The double blind procedure minimizes patient placebo effect and experimenter expectancy. Both people are kept blind as to which experimental condition the participant is in.

Replicating and Generalizing the Findings

External validity is the degree to which the results of a study can be generalized to other people, settings or conditions. Replication is the process of repeating a study to determine whether the original findings can be duplicated. By using replication and by adding different factors to the original experiment (ie age of participant etc.) the external validity of the experiment is increased. If the secondary studies do not yield the same conclusion this may tell psychiatrists important things about the second (or first) group of people studied.

Ethical Principles in Human and Animal Research

Ethical Standards in Human Research

- Protect and promote the welfare of the participants
- Avoid doing harm to the participants
- Don’t carry out the studies unless the probable benefit much outweighs the risk

- Explain all aspects of the experiment to the participants and receive oral or written consent from the participant or guardian
- Take all reasonable steps to ensure consent is not given under coercion
- Ensure privacy and confidentiality

Chapter 3

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Chapter 3 notes

The Neural Bases of Behavior

Neurons

- Neurons are the basic building blocks of the nervous system and are connected like electrical circuits
- The brain has about 100 million neurons
- Each neuron consists of: **cell body, dendrites, and an axon**
- The dendrites collect information from neighbouring neurons and send them on to the cell body
- A single axon extends from the cell body which passes messages to other neurons, muscles, or glands
- More than 200 types of neurons have been viewed through electron microscopes
- Neurons are supported by **glial cells** which surround the neurons and hold them in place, manufacture nutrients that neurons need, form myelin sheath, and absorb toxins and waste
- Glial cells protect the brain from toxins
    - The **blood-brain barrier** prevents many substances from entering the brain

Nerve Conduction: An electrochemical Process

- Neurons can: **generate electricity and release chemicals**
- Neurons are surrounded in a saline liquid environment
    - The high concentration of sodium carries a positive electrical charge
    - The inside of the neuron, however, is electrically negative
    - Thus an **electrical resting potential** of about -70mV is formed across the membrane (polarized state)

Action Potential

- An action potential or nerve impulse is a sudden reversal in the neuron's membrane voltage from -70mV to +40mV (**depolarization)**
- Depending on the stimulation from other axons, the neuron will either depolarize a lot or a little (**graded potentials)**
    - If it depolarizes enough, then it reaches an action potential
    - This makes the action potential an **all or none** phenomenon
- Graded potential change the membrane potential by acting on small protein structures in the cell membrane called **ion channels**
- When the ion channels open, it allows positive charges to enter to make the inside less negative
    - The threshold to reach action potential is usually about-55mV, about 15mV difference from the resting potential
- During action potential, the sodium channels open, which allows positive Na+ ions to flow into the axon
- When the potential is reached, the K+ ion channels open to let K+ ions out, which brings the membrane into a refractory period
- A pump restores the K+ and Na+ ratios back to its original state
- During the refractory period, the membrane cannot discharge another action potential
- The nervous system differentiates between different stimulus through the number of neurons

firing as well as the rate of firing

The Myelin Sheath

- The myelin sheath covers the axons
- It is a fatty, whitish insulation layer derived from glial cells
- It is interrupted by **the nodes of Ranvier** where the mylin is either extremely thin or absent
- In myelinated axons, electrical conduction can skip from node to node to account for high conduction speeds of more than 300km per hour
- **Multiple sclerosis** is a disease where a person's own immune system attacks the myelin sheath

How Neurons Communicate: Synaptic Transmission

- The neurons are not in physical contact, but communicated at a **synapse**
- The neurons relased chemicals from one neuron to the next
- There is a gap called the **synaptic cleft** between the neuron and the dendrite of the next neuron

Neurotransmitters

- Neurons produce **neurotransmitters** which are chemical substances that carry messages across the synapse to either excite other neurons or inhibit their firing
- This happens in 5 steps
    1. **Synthesis:** chemical molecules are formed inside the neuron
    2. **Storage:** molecules are stored in chambers called **synaptic vesicles** within the axon terminals
    3. **Release:** the molecules are released in the sending (presynaptic) neuron
    4. **Binding:** the molecules bind at the receiving (postsynaptic) neuron
    5. **Deactivation:**

Excitation, Inhibition, and Deactivation

- The binding of a transmitter molecule can either excite the postsynaptic neuron (through depolarization) or inhibit it through **hyperpolarization** by allowing potassium ions to flow out of the neuron or negative ions such as chloride to flow into the neuron
- Neurons are constantly bombarded by excitatory and inhibitory neurotransmitters from other neurons and their interplay determines whether the action potential fires
- A neurotransmitter continues to inhibit or inhibit a neuron until it is **deactivated** which occurs in 2 ways
    1. Deactivated by other chemicals located in the synaptic space that break them down into their chemical components
    2. **Reuptake**: reabsorption into the presynaptic axon
- Drugs influence neurotransmitters by either mimicking the effect of a neurotransmitter or preventing other transmitters access to these receptors
    - Eg. Opiates and nicotine mimick the effect of natural transmitters

Specialized Transmitter Systems

- There are about 100 to 150 difference substances that are suspected neurotransmitters in the brain
    - Various systems in the brain only recognize certain chemical messengers, they are immune from the messages from other systems
- **Table 3.1: Important neurotransmitters and their effects**
- Acetylcholine is important in memory and muscle activity; underproduction may be an important factor in alzheimer's disease
- Ach is also an excitatory transmitter that activate muscle cells
    - Botulism (from improperly canned foods) block the action of Ach which results in paralysis
    - Black widow spiders causes a lot of ACh to be produced, which can cause muscle convulsions and possible death

- In Parkinson's disease, a group of dopamine producing neurons degenerate and die
- Schizophrenia is treated by drugs that prevent dopamine from having its effects
- Depression is involved in an abnormal sensitivity to **serotonin**, a neurotransmitter that influences mood, eating, sleep, and sexual behavior
- Drugs can either block the reuptake of serotonin (meaning that it will be binded at the postsynaptic terminal for a longer time) or inhibit the activity of enzymes in the synaptic space that deactivate serotonin
- **Endorphins** are a group of neurotransmitters that reduce pain and increase feelings of well being
    - The opiate group bind to the same receptors which produce similar psychological effects
- **Neuromodulators** increase or decrease the sensitivity of thousands of neurotransmitters to their specific transmitters

The Nervous System

- 3 major types of neurons carry out the nervous system's input, output, and integration functions
- **Sensory neurons** carry input messages from sense organs to the spinal cord and brain
- **Motor neurons** transmit output impulses from brain and spinal cord to the body's muscles and organs
- **Interneurons** perform connective or associative functions within the nervous system
- The nervous system can be divided into the **central nervous system**: which consists of all the neurons in the brain and spinal cord and the **peripheral nervous system**: which is compsed of all the neurons that connect the central nervous system with the muscles, glands, and sensory receptors

Peripheral Nervous System

- It helps carry out the input and output functions that are necessary for us to sense what is happening inside and outside our body
- It has 2 divisions, the somatic nervous system and the autonomic nervous system

Somatic Nervous System

- Consists of sensory neurons that are specialized to transmit messages from the eyes, ears, and other sensory receptors
- It also has motor neurons to control our voluntary movement
- The axons of sensory neurons group together to for sensory nerves and the motor neurons combine to form motor nerves

Autonomic Nervous System

- Controls the body's internal environment such as the smooth muscles, the blood vessels, and digestive system
- It has two divisions: the sympathetic nervous system and the parasympathetic nervous sytem
- The **sympathetic nervous system** has an activation or arousal function and tends to act as a unit
    - Eg. When you are stressed your heart pumps more blood, pupils dilate, and digestion slows down so blood can go to muscles (*fight or flight)*
- **Parasympathetic nervous system** is more specific and has the opposite effect of the sympathetic one
    - It slows down body processes and maintains a state of tranquility
    - It works in balance with the sympathetic nervous system to maintain *homeostasis*, a balanced internal state

The Central Nervous System

- Contains the spinal cord and the brain

Spinal Cord

- Most nerves enter and leave the central nervous system by way of the spinal cord
- Some simple stimulus-response sequences, known as spinal reflexes, can be triggered at the spinal

cord without brain involvement
    - Eg. Touching a heat source

The Brain

- It is a 3 pound organ that makes up who you are and consumes the most energy of all body organs
- The brain never rests

Unlocking the Brain

Neuropsychological tests

- This measures the verbal and non-verbal behaviours that are known to be affected by particular types of brain damage

Destruction and stimulation techniques

- Researchers can produce brain damage under controlled conditions in animals to see what the consequences are
- They can also stimulate the neurons to do the opposite

Electrical Recording

- Researchers use **electroencephalogram (EEG)** to map out large areas of the brain's electrical activity
    - It can be used to detect abnormal electrical patterns in the brain

Brain Imaging

- **CT** scans use X-ray technology to study brain structures
    - A focused beam of X-ray takes pictures of narrow slices of the brain
    - It is far more sensitive than traditional X-ray procedures
- **PET** scans measure brain activity such as metabolism, blood flow, and neurotransmitter activity
    - The brain uses glucose for energy, and when they are more active, they consume more glucose
    - Radioactive glucose is injected into the blood stream where it travels to the brain
    - The energy transmitted by the radioactive substance is measured by the PET scan
- **Magnetic resonance imaging**
    - Can be used to study both brain structures and brain activity
    - The person is placed in the core of a long magnetic cylinder and the atoms in the subject's body are exposed to a uniform magnetic field

The Hierarchical Brain: Structures and Behavioral Functions

- The crowning feature of the brain is the cerebrum
- It has 3 major divisions: the hindbrain, the midbrain, and the forebrain

The Hindbrain

- As the spinal cord enters the brain, it enlarges to form structures that compose stalklike **brain stem**

Brain stem: life support systems

- The **medulla** plays an important role in vital body functions such as heart rate and respiration
- Most of the sensory and motor nerves cross over within the medulla, so the left side controls the right and the right controls the left
- The **pons** lie above the medulla and serves as a bridge carrying nerve impulses between higher and lower levels of the nervous sytem
    - It also regulates dreams
- The **cerebellum** consists of mainly grey matter and is concerned primarily with muscular movement coordination
    - It regulates complex rapidly changing movements that require exquisite timing

The Midbrain

- Contains clusters of sensory and motor neurons
- It contains an important relay centre for the visual and auditory systems
- It also controls eye movements
- The **reticular formation** acts as a sentry that either blocks messages or allows them to pass

    - It as an ascending part which sends input to higher regions of the brain
    - It also has a descending part which higher brain centers can either admit or block out sensory input
    - Eg. Some anesthetics work by blocking out the signals ascending to the brain
    - Eg. Electrical stimulation of some parts of the reticular formation can produce instant sleep and wakefulness in animals

The Forebrain

- Most profound difference between people and animals is the size and complexity of the forebrain (*cerebrum)*
- The **thalamus** is an important sensory relay station that routes signals to appropriate parts of the brain
    - Damage to the thalamus can cause confusion and disordered attention in the victims (schizophrenia)
- The **basal ganglia** is critical for voluntary motor control (as opposed to reflexive, and automated control of the cerebellum)
    - Eg. In Parkinson's Disease, the neurons that supply dopamine to the basal ganglia degenerate and die, the basal ganglia malfunctions and the ability to initiate voluntary movement is lost
    - Parkinsons cause handshaking, then jerky movements that can only be performed when initiated by a push, and finally paralysis occurs
- The **hypothalamus** plays a role in controlling sexual behavior, temperature regulation, eating, drinking, aggression, and the expression of emotion
    - Eg. Destruction of one part of the hypothalamus can lead to impotence
    - Eg. Damage to another part causes extreme overeating
    - Parts of the hypothalamus produce a substance called **orexins** that stimulate eating
- The **limbic system** have an important partnership with the hypothalamus and helps to coordinate behavior needed to satisfy motivational and emotional urges
    - Eg. Damage to this system would cause you to be unable to carry out organized sequences of actions to satisfy your needs
    - Two major structures are the **hippocampus** and the **amygladala**
    - **Hippocampus** is involved in forming and retrieving memories, damage to this area can cause severe memory impairment for recent events
    - The **amygdala** organizes emotional response patterns, particularly those linked to aggression and fear
        - Stimulation in some parts cause aggressive posture and behavior, while stimulation in other parts cause fear and the inability to act
        - It can produce emotional responses without the higher centres of the brain knowing that we are emotionally aroused
        - Peter Olds and Peter Milner also concluded that it is the pleasure center of the brain
            - They put electrodes in the amygdala and witnessed that the rat would do a lot to be electrically stimulated there
            - Electrical stimulation of the hypothalamus activates axons that goes to the limbic structure is called the **nucleus accumbens**

The Cerebral Cortex: Crown of the Brain

- The **cerebral cortex** is a grey sheet of cells that form the outermost layer of the human brain
- It is perhaps the most distinguishing part of the human body
- People who lack it lack the ability of advanced thinking
- The cerebral cortex has many fissures and they divide up the many parts of the brain
- There are 4 lobes: **frontal, parietal, occipital,** and **temporal;** each with a particular sensory and motor function
- Speech and skeletal motor functions are located in the frontal lobe

- The parietal lobe governs body sensations, separated by the **central fissure** between the frontal and parietal lobe
- Vision is associated with the occipital lobe

Motor Cortex

- Controls 600 or more muscles involved in voluntary body movements lie at the rear of the frontal lobe
- Specific body areas are dedicated in specific parts of the cortex

The sensory cortex

- Specific areas have been identified to different areas of the cortex with the exception of taste and smell
- **Somatic sensory cortex** receives sensory input that gives rise to sensations of heat, touch, cold, balance, and body movement
    - It lies in the parietal lobe behind the motor cortex with the uppermost parts controlling the bottom of the body and the lower parts controlling the upper parts
    - The major sensory area for vision lies at the rear of the occipital lobe
    - Each eye and ear sends signals to opposite sides of the brain; the loss of sight or hearing in one has little effect on the other
- When we hear high sounds, certain neurons fire and when we hear low sounds, other neurons fire
- The sensory cortex is also sensitive to experience
- **Wernicke's area** in the temporal lobe is involved in language comprehension
- **Broca's area** is in the frontal lobe is necessary for normal speech production
- **Association cortex** is found in all regions of the cerebral cortex is involved in the highest level of mental functions including perception, language, and thought
    - Damage to the association cortex can cause disruption of speech, understanding, thinking, and problem solving
    - It accounts for about 75% of the human cerebral cortex
    - Skoyles suggests that our ability to learn learning allowed us to upgrade our cognitive skills faster than natural selection alone
- The **frontal lobe** accounts to about 29% of the cortex and accounts for qualitites such as self-awareness, planning, initiative, and responsibility
    - It is also involved in emotional experience such as happiness, sadness, or disgust
    - People with lobe damage often exhibit apathy and lack of concern
- The **prefrontal cortex**, located behind the forehead, has **executive functions** which are mental abilities involved in goal setting, judgment, strategic planning, and impulse control
    - People with damage to this part seem oblivious to the future consequences of their actions and only governed by immediate consequences
    - A study of people who pleaded not guilty by reason of insanity showed that they have reduce prefrontal lobe activity which they lack forethought and impulse control

Hemispheric Lateralization: The Left and Right Brains

- The left and right cerebral hemisphere is connect the **corpus callosum,** which allows the two sides to function as a single unit
- **Lateralization** is the greater localization of a function in one hemisphere or the other
- The left side is responsible for speech, mathematics, and logic
- When Broca's or Wernicke's speech areas are damage, **aphasia**, loss of ability to communicate, occurs
- When the right side is damaged, spatial abilities are impaired
    - Eg. Forgetting well travelled routes, mistaking common objects
- The right side is responsible for music, artistic abilities and the ability to comprehend spatial relations
- When stimuli is presented to one hemisphere before the other, a difference can be detected
    - Eg. When music is presented to the right hemisphere first, it reacts faster

    - Eg. Words are identified more quickly if it is presented to the left hemisphere first
    - Right is 20% faster at recognizing music than left
    - Left is 20% fast at identifying words than right
- Corpus callosum allows information to be passed between the two
- Right hemisphere is more active when feeling negative emotions such as sadness and anger
- Left hemisphere is more active when experiencing happy emotions
- Roger Sperry addressed what would happen if the link between the left and right side is broken
    - Your right eye sends information to the left side of the brain and vice versa, but get a unified view of the situation because the two sides communicate with each other
- Sperry found that people with severed corpus collosams have impaired abilities
    - When a word is flashed to the left eye (right hemistphere), the subject could not describe what they just saw on screen, which indicates that the right hemisphere does not have well-developed language abilities
    - However, the right hemisphere can still recognize objects
        - Eg. If a toothbrush is shown, the person can use their left hand to find the brush, but he would not be able to name it in language until it is transferred to the right hand (left hemisphere)
- Right hemisphere has better recognition abilities
- There is a hypothesis that each hemisphere is a mind on its own
    - Some say that the conscious self resides in the left hemisphere because consciousness is based on our ability to verbalize about the past and present
    - One split brain victim learned to use scrabble letters with the right hemisphere and each hemisphere was asked what his ideal occupation was
        - The left hemisphere answered differently from the right

Hemispheric lateralization of language

- Language is mostly left hemisphere
    - Chimps have greater left hemisphere in the area that corresponds with Wernicke's area
- 90% of people are right handed, 95% people have left hemisphere language dominance, a small minority have localized language on their right hemisphere
- Even blind people showed greater left side dominance in braille
- Men show mostly left side activity in language while women showed activity on both sides

Plasticity in the Brain: The role of experience and the recovery of function

- Learning, and exposure to new information changes your brain in a way that makes you a different person than you were before
- **Neuron Plasticity:** the ability of neurons to change in structure and function

Early experience

- Brains of rats that was raised in a stimulating early environment had larger brain sizes, more connections, and more neurotransmitters
- Musicians have better developed right hemisphere somatosensory areas devoted to the fingers
- Prematurely born infants showed faster neurological development than those who weren't
- Alcohol exposure in womb can produce lifelong behavioral and mental damage

Recovery of Function after injury

- Neurons can take over the function of other neurons that have died during the injury
- Brain damage suffered earlier in life is less devastating that those later in life
    - Eg. A child having a stroke can recover faster and better than the elderly
- Brain is capable of greater plasticity early in life
- Neurons taken from cats were grown in a medium
    - Neurons from younger cats can survive and create new synapses while those taken from

older cats could not survive
- Neurons are programmed for cell death
    - When neurons die other neurons replace their function or increase the volume of neurotransmitters
- In primates, the hippocampus has been shown to generate new neurons which is important in memory
- Those who use their brains more often are much better at retaining their synapses

Nervous system interactions with the endocrine and immune systems

Interactions with the Endocrine System

- **Endocrine system** consists of numerous glands distributed throughout the body (fig. 3.24)
- Conveys information via **hormones** (chemical messengers secreted into the blood stream)
- The endocrine messages can affect the nervous system and the mental processes in the brain can affect the endocrine system
    - Eg. A hypothesis states that Voodoo magic makes the person think that they are going to die which causes the release of lots of stress hormones which could cause a fatal blood pressure drop
- The **adrenal glands** are twin structures on top of the kidneys
    - Secretes **cortisol** which allows the person to function despite stressful conditions
    - However, high levels of stress hormones can cause the deterioration of the hippocampus which is related to cognitive and memory functions
- Moderate levels of stress early on in life can lead to faster stress recovery later on
- Better mothers can have an effect on later life stress recovery abilities
- The endocrine system is much slower than the nervous system, but is able to target billions of cells individually

Interactions involving the immune system

- Immune system is able to detect antigens and destroy them
- Once the immune system has encountered the antigens that enter the body, it retain a memory that allows it to produce more to destroy the particular antigen
- Problems arise when the immune system is either underactive or overactive
- Underactive immune systems include AIDS which attacks the helper T cells which are responsible of calling into action the antigen killing cells
    - It also includes cancer, which the immune system allows the cancer cells to proliferate
- Overactive response can cause problems in terms of allergies
    - Eg. In an asthma attack, the allergen releases a torrent of histamine, which causes the bronchial tubes to contract
    - It could also cause an **autoimmune reaction** when the body mistakenly attacks a body part
        - Eg. in rheumatoid arthritis, the immune system attacks the joints
- The immune system is related to the nervous system
    - Eg. the stimulation of certain parts of the cerebral cortex instantaneously increases or decreases immune system activity
    - Eg. Injecting antigens into the body causes electrical stimulation in the brain
    - The immune system can make neurotransmitters and hormones, allowing it to affect both the nervous and the endocrine system
    -

Chapter 4

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Genetic Influences

Chromosomes and Genes

- Gregor Mendel and the peas
    - Genetics is not a simple blend of parental characteristics
- **Genotype:** specific genetic make up of an individual
- **Phenotype**: Observable characteristics produced by that genetic endowment
- Phenotypes can be affected by the environment
- Egg and sperm cells carry **chromosomes,** a tight arrangement of DNA and protein
    - DNA portion carries the hereditary blueprint in units called genes
- All human cells have 46 chromosomes, except gametes which have 23
- Gene's main purpose is to produce proteins

Dominant, Recessive, and Polygenic Effects

- Dominant genes will be displayed in the phenotype
- Recessive genes do not if paired with a dominant gene, but will be expressed if pair with another recessive gene
- **Polygenic transmission** is when gene pairs have a combined influence on a single phenotypic trait

Mapping the Genetic Code

- The Human Genome project started in 1990 and finished in 2001 mapped the entire human genetic sequence
- A computer (Deep Maple) was the main database for the project
- Discovered that humans have about the same number of genes as fruit flies

Genetic Engineering: The Edge of Creation

- In **recombinant DNA procedures** researchers use certain enzymes to cut the threadlike molecules of DNA into pieces, and combine them with DNA from another organism and insert them into a host organism such as a bacterium
- The human growth hormone can be created this way to treat people with short statures
- There are methods of inserting genetic material into viruses that can infiltrate neurons to change their genetic structure
- One was done on animals to alter a specific gene so that its normal functions are disrupted
    - This is called a **gene knockout** because the particular function of the gene is eliminated
    - One experiment was done by Holmes, Dennis, and Jacqueline in which they knocked out the mechanism in reuptake of serotonin
        - This alteration caused the mice to have exaggerated stress response
- More than one gene is usually responsible for a certain behavior
- Knocking out one gene have affect a wide range of functions

Behavior Genetics Techniques

- Offspring has a 50% chance of having the same genes as parents
- 50% chance of having the same genes as brothers or sisters
- 25% chance of grandparents
- **Heritability coefficient** is the extent to which varation in a particular characteristic within group can be attributed to genetic factors
- **Heritability** means how much of the variation in a characteristic within a population can be attributed to genetic differences
    - Eg. Range of body weights: how much of that range is due to genetic variances
    - Applies only within groups
- If a characteristic has higher **concordance** in people who are related, this points to a genetic contribution particularly if they lived in different environments
- In **adoption study** people adopted in which characteristics are compared both between the biological parents and the adoptive parents
    - If the adoptee has more similarities to the adopted parents, environmental factor is more important
    - If the adoptee has more similarities with the biological parents, then gentics is more important
    - Eg. Schizophrenia: adoption parents only had 3% family members with the disease while biological parents had 12%, which shows that it is probably hereditary
- **Twin Studies**
    - Monozygotic (identical) are genetically identical
    - Dizygotic twins (fraternal) are like any regular brothers and sisters
- Identical twins have many similarities to each other
    - Even when they are raised in different environments (separated early childhood)
- People with biological fathers with criminal records, but adoptive father with no criminal record have high criminal records
- People with biological fathers with low criminal records, but adoptive fathers with high criminal records, had low criminal records
- If both adoptive and biological fathers had criminal records, then the child has the highest criminal record of all

Genetic Influences on Behavior

- All of our behavior reflect the interaction between the genes and the environment

Heredity, Environment, and Intelligence

- Suppose that intelligence is totally determined by genes
    - Then the correlation between identical twins should be +1.00
        - Evidence shows that this is not the case
    - However, the more genes that people share the more similar their IQ will be
        - Eg. Biological parents and their child have more similar IQ than adoptive parents and their adopted child

Biological Reaction Range, Environment, and Intelligence

- **Reaction range:** for a genetically infleunced trait is the range of possibilities - the upper and lower limits - that the genetic code allows
- Genetic variations cannot be measured directly, but studies show that it could be 15 to 20 points on the IQ scale
- Eg. Figure 4.6

Behavior Genetics and Personality

- Personality traits such as extraversion-introversion reflect differences in brain arousal

- Certain behaviors such as novelty seeking has been linked to genes that affect the levels of dopamine
- Variation among individuals on each personality trait can be divided into 3 components
    1. Variation attributable to genetic factors
    2. Variation due to a shared family environment among those reared together
    3. Variation attributable to other factors, such as unique individual experiences
- The environment had little influence on identical twins reared apart
- The individual's unique experience, school, social interactions, accounted for a significant portion of the variation
- A survey was done on twins showed that the highest heritability coefficients were attitudes towards reading books, abortion, playing organized sports, riding roller coasters, and death penalty
    - There may not be genes directly influencing these behavior
        - Eg. The enjoyment of rollercoasters may be based how robust the inner ear is
    - Genetic influences may also influence alcohol abuse, personalities disorders

Evolution and Behavior

- Evolutionary Psychology seeks to understand how behavioral abilities and tendencies have evolved over the course of half million years
- **Biologically based mechanisms** receive input from the environment, process the information, and responds to it to create behavior
    - Eg. The wolf howl allows the wolf to communicate over a long distance and stay away from competing wolf packs
        - This allows the wolf to survive by creating mechanisms that allow this behavior
    - In humans, aggression, altruism, and sex roles are examples of evolved mechanisms

Evolution of Adaptive Mechanisms

- **Evolution** is a change over time in the frequency with which particular genes occur within an interbreeding population
- Some genetic variations come from mutation

Natural Selection

- Characteristics that increase the likelihood of survival and reproduction will be more likely to be preserved in the population
- There is a filter that increases the number of characteristics present in the survivors and decrease the characteristics found in nonsurvivors
- Some neutral variations are passed on without bias and are known as *evolutionary noise* and it could be important in the future
    - Eg. Radiation tolerance after nuclear war

Adaptations

- They allow organisms to meet recurring environmental challenges to their survival
- It is important for an animal to pass on its genes, which explains why animals sometimes risk their own safety to protect their kin
- Biology -> behavioral capabilities -> survivability
- Dwindling vegetation favored those with bipedal locomotion to survive because they can hunt on plains, this also favors use of tools, the development of language, and social structure
- The greatest pressure came to abilities for attention, memory, language, and thought because they became essential for survival
- Today, our brain is actually smaller than those of the Neanderthal which shows that

cultural evolution is also important in the development of adaptations
- **Domain specific adaptations** are designed to solve a particular problem such as selecting a suitable mate, choosing safe foods to eat, etc
- The brain is a collection of specialized and somewhat independent modules

An Evolutionary Snapshot of human nature

- Infants are born with innate ability to learn any language spoken, deaf infants are able to learn sign language
- They are able to perceive certain specific stimuli
    - They are more responsive to pictures of human faces than random features arranged a mess
    - They can distinguish the odor of their mother's milk
- At 1 week of age, infants show primitive math skills
- Humans have a need to belong and fear of being ostracized from the group
- Some basic emotions are universalized such as happiness and goodwill

Evolutionary Psychology

- A perspective where all behavior is linked to how those functions contribute to the success and adaptability of the individual

Personality

- **Evolutionary Personality Theory** asks where did human traits come from in the first place
- There are limited number of basic dimensions to human personality
    - This is consistent throughout all cultures of the world because they help us survive physically and reproduce successfully
- Evolutionary theorists regard basic personality traits as being sculpted by natural selection until they become part of human nature
- Biologically, people had to ask 5 basic questions when they interact with another person, in order or importance
    1. Is person X active and ominant or passive and submissive? Can I dominate X or will I have to submit to X?
    2. Is person X agreeable and friendly, or hostile and uncooperative?
    3. Can I count on X? Is X conscientious and dependable?
    4. Is X sane (stable, rational, predictable? Or crazy (unstable, unpredictable, possibly dangerous)
    5. How smart is X, and how quickly can X learn to adopt?
- Human beings are capable of changing their behavior in order to adapt

Mating Systems and Parental Investment

- At one extreme species make lots of offspring and offer little to no care about the survival of them
    - Eg. Fish laying eggs
- At the other end, little offsprings are produced, but are protected and cared for until they are self sufficient and capable of surviving on their own
    - Eg. Humans and elephants
- One difference across species is **parental investment** which refers to the time, effort, energy, and risk associated with caring successfully for each offspring
    - If the investment is unequal, then that mate will be more discriminating in choosing a mate and will be more rigorously competed for
    - Eg. Women have to go through gestation, breastfeeding

- If female investment is high while male investment is low, then polygyny would be most common because males can maximize their fitness by reproducing with many females
    - This would yield in larger and stronger males because it helps them compete for the female
- If both male and female investment is high then **monogamous mating system** is more likely
    - It is unlikely that a single parent can successfully raise an offspring
    - Monogamous species show little sexual dimorphism in size or strength and competition comes from both sexes
- **Polyandry** is when females mates with many males and is seen in some fish, insects, and birds
    - The females a usually larger, stronger, and more aggressive
- **Polyganandry** is when all members of a group mate with all other members of the group
    - Found in primates such as chimpanzees and bonobo chimps
    - One way to reduce competition for a mate and allows them to be more peaceful species
- Birth control has altered much of the selective pressure for specific mating patterns
- Women generally have to offer more parental investment

Mate Preference

- Most common mate preferences come from an evolutionary perspective
- Men and women rate mutual attraction, dependability, and emotional stability as the three most important characteristics
- Men place greater value on physical attractiveness and good health
- Women place greater value on male's earning potential, status, and ambitiousness
- Women prefer older men
    - On average, the groom is 3 years older than the bride
    - This makes sense because status, potential, etc comes later in life
- Women showed preference for symmetrical faces and other signs of physical health
    - Shows that men are free from parasites or has genetic resistance to parasites
- Male attractiveness is enhanced by signs of parental investment and decreased by indifference toward a child in distress
- Males have no preference towards whether the woman shows more parental investment
- Males prefer women who display signs of youth such as clear smooth skin, and signs of physical health such as symmetrical faces
    - Showed preferences for animated facial expressions, high energy level, and a bouncy youthful gait
- There is a cross cultural rating of attractiveness for women
    - The average correlation in attractiveness rating in males of different racial groups was +0.95
    - Preferences for specific waist to hip ratio has also been consistent cross culturally

Altruism

- **Cooperation** refers to a situation where helping another individual will also gain some personal advantages
    - This yields many benefits
- **Altruism** is when helping another will have a certain risk for the individual
    - Eg. Bird that calls out to alert the flock of a predator puts themselves at risk
- On the surface it doesn't seem to make sense in evolution
- There are 2 important theories

1. **Kind selection theory**
    - Altruism developed to increase the survival of relatives
        - Eg. Maybe siblings, aunts and uncles are in the flock and while the individual may perish, the genetic code of the animal is more likely to be passed on
2. **Theory of Reciprocal Altruism**
    - Altruism is long term cooperation
        - Eg. One individual may help another but the assistance will be reciprocated sometime in the future
        - This requires a stable group so that the deed is likely to be reciprocated

Aggression

- Most valued resources are in limited supply
- Animals must compete with others or other groups to decide who gets the resources
    - Eg. Male birds attacking other male birds during mating season
- One of the most common causes of homicide is sexual jealousy usually with two men fight for a woman
- Social animals have developed dominance hierarchies so that they don't compete again and again
    - This allows members to decide who gets the resource without wasting energy
- Besides deciding who gets the resource, the hierarchy is also used to quell aggression
    - Eg. Dominant males have used their position to stop fighting among subordinates
- In chimps and humans only, there are coalitions to attack other groups

How not to think about behavior genetics and evolutionary psychology

Genetic Determinism

- **Genetic determinism** is when genes have invariant and unavoidable effects
    - Eg. If you have a gene for alcoholism, you are going to be an alcoholic
- Our understanding of human genetics will mean that there may be a cure available to compensate for the genes
- Genes have a role in determining the reaction range for certain things such as intelligence, but the environment still plays an important role
- Aggression, for example, is due to the environment in a major way

Social Darwinism

- This means that if the more fit are more successful, then those on the top rungs of social and economic ladder must be most fit of all
- Eugenics assume that the genes of one group are in some measurable way better than the genes of another group

Defending the Status Quo

- Evolutionary analyses of human behavior legitimizes the status quo
    - Ie. If genetics and our evolutionary history have resulted in the presence of a trait or behavior it is natural and right
    - If people formed fighting coalitions, there's no point in trying to stop it because its coded in our genes
- If something is happening, it should remain so because genetics knows what its doing

Chapter 5

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Synaesthesia: Mixing senses together

- Sensation to Perception
    - Stimulus is received by sensory receptors -> receptors translate stimulus properties into nerve impulses -> feature detectors analyze stimulus features -> stimulus features are reconstructed into neural representation -> neural representation Is compared with previously stored information in the brain -> matching process results in recognition and interpretation of stimuli
- **Sensation** is the stimulus detection process by which our sense organs respond to and translate environmental stimuli into nerve impulses and are sent to the brain
- **Perception** is when we actively sort the information and makes sense of it
    - It's an active and creative process; the same stimuli can give rise to different perceptions
    - Your interpretation of a sensation is influenced by the **context** of the stimuli (eg. Reading)

Sensory Processes

- Sensory is only possible because of specialized sensory receptors that can translate light, sound, and touch for the brain to interpret
- 5 senses: vision, hearing, touch, taste, smell
- Human sensory system is designed to increase our survivability
- **Psychophysics** studies relations between physical characteristics of stimuli and sensory capabilities

Stimulus Detection: The Absolute Threshold

- **Absolute threshold:** The lowest amount of stimulus in which one can detect its presence 50% of the time
    - This is because we are often unsure of whether we can detect very faint stimulus
    - Lower absolute threshold -> greater sensitivity

Signal Detection Theory

- Psychologists determined that one's sensitivity to stimulus can vary
- People set their own **decision criterion**, which is a standard of how certain they must be that a stimulus is present before they say they will detect it
    - This can change over time as a result of fatigue, expectation, and potential significance of the stimulus
- **Signal detection theory** is concerned with the factors that influence sensory judgments
- Eg. A ship captain will have a low decision criterion and be able to see very faint blips on the radar
- Subliminal messages are signals below our absolute threshold and does not register in our conscious mind; it has some effect on our conscious attitudes

The Difference Threshold

- The **difference threshold** is the smallest difference between two stimuli that a person can detect 50% of the time
    - Aka *just noticeable difference (jnd)*
- **Weber's law:** difference threshold is directly proportional to the magnitude of the stimulus with which the comparison is being made and is known as **weber's fraction**

    - Eg. The jnd value for weight is 1/50; this means that there has to be a difference of 1/50 of the original weight for a difference to be noticed; for a 50g weight, an increase or decrease of 1g is required for the difference to be detectable
    - Weber's law does not work at very low or very high intensities
    - Smaller Weber's fraction = more sensitivity

Sensory Adaptation

- Our sensory system is tuned to detect changes in stimulation, and the diminishing sensitivity to unchanging stimulus is called **sensory adaptation**
    - Eg. Not feeling a watch on the wrist after a long time
    - If it weren't for small retina movements, even vision would vanish
- Sensory adaptation is adaptive because it frees our senses from constant mundane pick up of information

The Sensory Systems

Vision

- Human can only sensitive of wavelengths between 700nm (red) to 400nm (blue-violet); bees can detect x-rays and snakes can detect infrared energy

The human eye

- Light enters the eye through the **cornea,** a transparent protective structure
- Then it passes by the **pupil**, which can dilate or constrict to control the amount of light entering
    - The size of the pupil is controlled by the colored **iris** that surrounds the pupil
- Behind the pupil is the **lens** which can get thicker or thinner to focus the light on the **retina,** at the rear wall of the fluid filled eyeball
- The original image is flipped left to right and up to down, but the brain reconstructs the input
- **Myopia** (near sightedness) causes eyeball to become longer; and the lens is too close to the image
- **Hyperopia** (far sightedness) The image is too far from the lens; causes eye ball to become shorter
    - Age related hyperopia often corrects for myopia

Photoreceptors: The Rods and Cones

- The retina is a multilayered screen that contains specialized sensory neurons
- There 2 types of light receptors known as **rods** and **cones**
    - 120 million rods and 6 million cones
- **Rods** function best in dim light and are primarily black and white; about 500 times more sensitive to light than cones;
- **Cones** are color receptors and functions best in bright illumination
- Humans have rods are found throughout the retina except in the **fovea,** a small area in the center of the retina that contains only cones
- Cones decrease in concentration the further from the center it is
- Light -> axons of the **ganglion cells (optic nerve)-> bipolar** cells -> rods and cones
- The light sensitive parts of the neuron points away from the light source, seeing only a fraction of the light entering
- Many rods connect to 1 bipolar cell where they can combine their electricity to fire it
    - It's easier to see dim light if you look slightly to one side so that the image doesn't fall on the fovea
- Many cones also share bipolar cells
- In the fovea, each cone has their own private line to a single bipolar cell, which results **in visual acuity**, our ability to see fine detail when images are projected directly onto the

fovea
    - Some birds have 2 fovea to see very fine details on the ground
    - Axons of the ganglion cells exit through the back of the eye not far from the fovea, producing a **blindspot** where there are no photoreceptors, but is ordinarily undetectable because the mind fills in the missing information

Visual Transduction: From Light to Nerve Impulses

- **Transduction** is when a stimulus is converted into nerve impulses
- **Photopigments** (proteins) in rods and cones translate light into nerve impulses
    - Absorption of light changes the rate of neurotransmitter release at the receptor's synapse with the bipolar cells; then to the ganglion cells where it is transmitted to the thalamus to be routed to the visual cortex of the brain

Brightness Vision and Dark Adaptations

- Rods and cones depend on wavelength of the light
    - Rods have higher sensitivity to all spectrums except for red
    - Cones are sensitive in low illumination to greenish-yellow range
- **Dark Adaptation** is the progressive improvement in brightness sensitivity that occur over time in low light
    - After absorbing a light, the photoreceptor is depleted to receptor molecules for a period of time
    - When you go from bright to dark, a large amount of photopigment will be depleted
    - During dark adaptation, the photopigments are regenerated and the receptor's sensitivity increases greatly
    - Fig. 5.8, graph of vision abilities in the dark of rods and cones vs time
- Fighter pilots often work in a red room to allow their rods to be in dark adaptation so they can be ready to take off in the dark at any given time

Colour Vision

Trichromatic Theory

- Any color combination can be created by a mixture of blue, green, and red (additive color mixture)
- **Trichromatic** theory claims that the eye perceives red, green, and blue in different intensities and mixes them together to generate a color
    - Cones are sensitive to all wavelengths, but specific ones are most sensitive to one of the 3 colors
- Theory inconsistent because it claims that yellow is made by red and green receptors, but people who are red green color blind are able to experience yellow
- Also, it doesn't explain **after image** (a different color after you look away)

Opponent process theory

- Each of the 3 different types of cones respond to 2 different wavelengths
    1. Red or green
    2. Blue or yellow
    3. Black or white
- Explains after image, because the afterimage is opposite the color of the original

Dual Process in Colour Transduction

- Combination of trichromatic and opponent process theory
- The trichromatic theory is right about the property of cones
- The opponent process theory is partially correct (???)

Color deficient vision

- 7% of males and 1% of females have red-green or yellow blue color systems

Analysis and Reconstruction of Visual Scenes

Feature Detectors

- Input is routed to the thalamus which routes the signal to the **primary visual cortex** in the **occipital lobe**
- There is an area specific correspondence between parts of the retina and the neurons in the occipital lobe
    - Fovea, where there are lots of cones, has a disproportionately large neuron area in the brain
- Some neurons are called **feature detectors** and they fire selectively in response to stimuli that have specific characteristics
- Neurons fire most frequently when lines of a certain orientation are presented
    - Eg. Some to horizontal ones, some to 30 degrees, and it goes 360 degrees
- Other feature detectors respond to different colors
    - Seeing an array of different colors allows you to **parallel process** the information; where different features are process separately at the same time to give you an unified view of its properties

Visual Association Processes

- Analyzed and recombined information is sent to **visual association cortex**
    - It combines the information with our knowledge and memories to give the object meaning

Audition

- Audio is in the formed of sound waves, where molecules go through phases of compression and expansion
- **Frequency** is the number of sound waves per second
    - **Hertz** (Hz)
    - Humans can detect 20Hz to 20000Hz
- **Amplitude:** vertical size of the waves; the amount of compression and expansion; how loud
    - **Decibels** (db), measure of physical pressure on eardrums
    - 0 is the absolute threshold for hearing
    - Every 10 increase in db is a tenfold increase in volume

Auditory Transduction: From pressure waves to nerve impulses

- Sound waves -> vibrates eardrum -> mid ear, which houses 3 bones called the **hammer, anvil, and stirrup** that amplifies the sound waves more than 30 times -> **oval window** (division to the inner ear) -> **cochlea** (liquid filled tube) -> **basilar membrane** (runs the length of the cochlea) -> **organs of Corti** rests on top of the basilar membrane that has tiny hairs that are sound receptors -> neurons -> thalamus -> auditory cortex in the temporal lobe
- The hammer, anvil, and stirrup causes the oval window to vibrate, which causes the fluid in the cochlea to vibrate, and vibrates the organs of Corti
    - The hair bending sends nerve signals

Coding of Pitch and Loudness

- Louder = more hair bending = more neurotransmitters = higher rate of firing
    - Some receptor neurons have higher thresholds than others and will only fire when considerable bending occurs
- 2 different processes for pitch; one for above 1000Hz an one for below
- 2 historic theories of sound
- **Frequency theory:** nerve impulses sent to the brain matches the frequency of the wave
    - Eg. 30Hz = 30 neuron firings per second
    - Max neuron firing speed is 1000 times, so how do we hear sounds above 1000Hz?
- **Place theory**: the fluid in the cochlea peaks at different places

    - This is causes different hairs to vibrate which is a cue to the brain of different frequencies

Sound Localization

- Our nervous system uses the time and intensity difference between the two ears to locate the source of the sounds in space
    - Eg. Sound straight ahead is receive at the same time with the same intensity and is perceived as straight in front

Hearing Loss

- 90% of people with hearing problems are born with normal ear functions
- **Conduction deafness** is caused by problems problems involving the mechanical system that transmits sound waves to the cochlea
    - Eg. Damage to the eardrum, or the midear
- **Nerve deafness** is caused by damaged receptors within the inner ear or the auditory nerve
    - Caused by aging, disease, and exposure to loud sounds over time
    - Loud sounds cause the hairs on the basilar membrane to fall off at a particular point of the basilar membrane

Taste and Smell: The Chemical Senses

- **Gustation (**taste) and **olfaction** (smell) are chemical senses

Gustation: The sense of taste

- Can only taste sweet, sour, bitter, and salty
- Other taste experiences affected by smell, temperature, and touch
- **Taste buds** are chemical receptors and are concentrated along the edges and back of tongue
    - Hairs project from the taste bud that leads into the taste pore
    - Substances interact with saliva to form a solution that flow into the taste pore and stimulate flavor

Olfaction: The Sense of Smell

- People who lose other senses have highly developed olfactory sense
    - Helen Keller can smell people's odors and distinguish them
- Most popular current smell theory is that different receptors respond to different smells and do not recombine such as vision
- Some researchers believe that **pheromones,** chemical signals found in natural body scents, may affect human behavior in subtle ways
- **Menstrual synchrony**, tendency for women who live together or are close friends to become more similar in their menstrual cycle
    - An experiment in which women to daubed with another female's underarm secretions resulted in their menstrual cycle become closer together, while the one daubed with a placebo did not have a similar effect

The Skin and Body Senses

- Includes sense of touch, kinesthesis (muscle movement), and equilibrium

Tactile Senses

- A lack of tactile contact with a caretaking adult retards, physical, social, and emotional development
- Humans are sensitive to pressure, pain, warmth, and cold
- The skin is the largest organ in the body
- Receptors for pain and temperature are **free nerve endings**
- The amount of somatosensory cortex devoted to a certain body part means that body part is more sensitive to touch (eg. Lips, fingers)

- **Phantom limb** phenomenon: amputees experience sensations coming from their missing limb
    - The neurons that used to connect to the limb sends false signals to the brain

Body Senses

- **Kinesthesis** provides us feedback about our muscles and joints' positions and movements
    - Gives us information needed to make proper movements
- **Vestibular sense:** sense of body orientation or equilibrium
    - Located in the inner ear in the **vestibular apparatus**
    - One part of the equilibrium system contains three **semicircular canals** which contain the receptors for head movement
    - Only sensitive to acceleration

Perception: The Creation of Experience

- To create perception: there are 2 kinds of functions
    - **Bottom-up processing:** the system takes in individual elements of the stimulus and combines it into a unified perception
    - **Top-down processing:** make use of higher order knowledge

Perception is Selective: The role of attention

- Many sensory messages fire as you read, but only a few are registered in your awareness
    Eg. How does your toe feel as you read?
    - You can shift to these unregistered information at any given time
- Attention involves 2 processes of selection
    1. Focusing on certain stimuli
    2. Filtering out other incoming information
- Studied experimentally through a technique called **shadowing**
    - When 2 things are happening at once, you can only pay attention to one of them and not both

Environmental and Personal Factors in Attention

- Environment can attract our attention through intensity, novelty, movement, contrast, and repitition
- Our interests and motives also influence what stimuli we will notice
    - Eg. We are sensitive to food related cues when we are hungry
- We are particularly sensitive to stimuli that might be a threat
    - Eg. When shown a picture of a happy person in an angry crowd, it takes longer to perceive than an angry person in a happy crowd

Perceptions Have Organization and Structure

- How do we see distinct objects when only different light waves are sent to our retina?
- Dr. Richards had brain damage and can no longer perceive objects as wholes; he sees people as separate moving parts and not a complete person; can't match mouth movement and voice

Gestalt Principles of Perceptual Organization

- The whole parts of what we perceive are more than the sum of its parts
- In **figure ground relations,** we organized stimuli into a central or foreground figure and a background
    - Eg. We perceive an apple with its distinct shape and color to be the foreground; melody of the music (foreground) and harmony (background)
- Gestalt psychologist claim that people can associate separate stimuli as a larger whole follow the four **Gestalt laws of perceptual organization:** similarity, proximity, closure, and continuity

    - Similarity: objects considered similar will be grouped together
    - Proximity: elements close to each other are likely to be perceived as a part of the same configuration
    - Law of closure: people complete open edges and fill gaps so that an incomplete figure appears more complete
    - Continuity: people tend to combine elements that continues better into one another

Perception Involves Hypothesis Testing

- **Perceptual schema**: recognition means that we have a **perceptual schema** (mental representation) to compare it with
    - Eg. We can identify people by their voices which brings out our inner presentation of that person
- Perception is an attempt to make the most sense of the stimulus input
- Sometimes your nervous system will have multiple perceptual schemas for a single stimulus and it will shift back and forth (Necker cube 5.31b)

Perception is Influenced by Expectations: Perceptual Sets

- USS Viecenne attacked an airplane that they thought was a fighter jet from Iranian gunboats; however it was a commercial airplane; even though sophisticated radar equipment clearly indicated that it was not a fighter jet
- Psychological environment could have caused the eyes to lie
- Because there was a feeling of impending attack from the Iranians, the top down interpretation of stimuli is changed by their fears and expectations; even though it should the plane was not on an attack course, it became the reality that the crewmen experienced
- They had a **perceptual set:** a readiness to perceive stimuli in a particular way
- When students were told that a particular lecturer was cold and evil, they liked him less than if they were told that he was warm and friendly even if they attended the same lecture

Stimuli are recognizable under changing conditions: perceptual constancies

- **Perceptual constancies** allow us to recognize familiar stimuli under varying conditions, otherwise we would have to rediscover things every time we something new
- **Shape constancies** allow us to recognize people and other objects from many angles
- **Brightness constancy**: relative brightness of objects remain the same under different conditions of illumination such as full sunlight and shade
    - This is because the ratio of illumination remains the same
- **Size Constancy:** size of an objects remain relatively the same even though it changes relative to distance
    - A person standing twice as far away isn't perceived as half as tall

Perception of Depth, Distance, and Movement

Depth and Distance Perception

- Images are 2D, but the brain translates them into 3 dimensional perceptions through **monocular cues** (which requires only 1 eye) and **binocular cues** (requires both eyes)

Monocular Depth Cues

- Patterns of **light and shadow**
- **Linear perspective:** parallel lines converging as they recede into the distance
- **Interposition:** objects closer cut off our view of more distant objects
- **Height in the orizontal plane:** objects further away appear higher in the plane of view
- **Texture and clarity:** less texture and clarity with distance
- **Relative size:** two similar objects; the one smaller appears further away

- **Motion parallax:** if we are moving, nearby objects may appear to move faster in the opposite direction than objects further away
- **Raphael Sanzio** of the School of Athens demonstrated these cues with his painting

Binocular Disparity

- **Binocular disparity** is when each eye sees a slightly different image
- Feature detectors are attuned to depth
- **Convergence:** your eyes have to move closer together to view a nearby objects which signals its distance to you

Perception of Movement

- Primary cue for movement is movement of stimulus across retina
- The movement through a static background is also a cue
- **Stroboscopic movement:** like frames in a movie appear like real movement

Illusions: False perceptual hypotheses

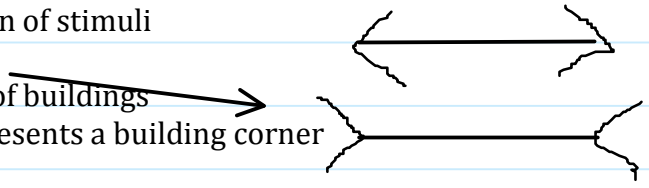
- Illusions are compelling but incorrect perceptions
- Attributed to perception constancies that usually allows us to perceive more accurately
    - Eg. The Ames room: usually rooms are rectangular, but this one as a converging corner, so a subject standing in the corner appears larger than people standing in other corners
- Our perception is strongly influenced by context in which the stimulus occurs
- There are also objects which cannot exist such as the devil's tuning fork because they have paradoxical cues

Experience, critical periods, and perceptual development

- Development of sensory and perceptual systems result from the interplay of biological and experiential factors
    - Eg. If you go blind and have to learn braille, the brain borrows neurons from other parts of the brain to increase the somatosensory cortex dedicated to the fingers
- A person who lived in a dense jungle was brought to a plain and he sees buffalos in the distance; he assumes they are insects and not buffalos, when they got close, he blamed the psychologist for using witchcraft to enlarge the insects
- If you wear glasses that flipped the image upside down, you eventually learn to accommodate

Cross-Cultural Research on Perception

- Cultures affect our perception of stimuli
- The Muller Lyer illusion
  Comes from our perception of buildings
  In which the longer one represents a building corner
  Coming out at you



Restored Sensory Capacity

- People that never had vision to begin with could not understand what vision was and cannot makes sense of colors, lights, and patterns (Virgil)
- Virgil went blind again, but considered a gift because he is released from a sighted world that bewildered him
- In a compiled study, people with restored vision can learn to recognize some simple geometric patterns, but still can't have full visual capacity like normal people
    - This shows that childhood development is critical

Chapter 6: States of Consciousness

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State of consciousness: a pattern of subjective experience, a way of experiencing internal and external events
Altered state of consciousness: variations from normal waking state

The Puzzle of Consciousness

- **Consciousness:** moment to moment awareness of ourselves and our environment
  - It's subjective and private; each having their own consciousness
  - Dynamic: continuous flow of ever changing mental activity
  - Self reflective and central to our sense of self
- Consciousness is connected with the process of **selective attention**

Measuring States of Consciousness

- Commonly using self report
- Can also be measured **physiologically** through EEG
- **Behavioral measures** can be used to evaluated performance on special tests such as the *rouge test* (red dot on the face of a chimp, and then showing the chimp a mirror to see if he notices it)

Levels of Consciousness: Psychodynamic and Cognitive Perspectives

- Freud said there are 3 levels of awareness
  1. Conscious mind: thoughts, perceptions, and other mental events that we are currently aware
  2. Preconscious mental events: outside of current awareness, but can be recalled under certain conditions
  3. Unconscious events: cannot be brought into conscious awareness under ordinary circumstances
     - Eg. Aggression, trauma; because it would invoke negative feelings

The Cognitive Unconscious

- Cognitive psychologists reject the notion of an unconscious mind driven instinctive urges and repressed conflicts
  - They view the unconscious as a mental life that works in harmony with the consciousness

Controlled vs Automatic processing

- **Controlled (effortful)d processing:** voluntary use of attention and conscious effort
  - Studying, planning a vacation
- **Automatic processing:** can be performed with little or no conscious effort
  - Recognizing faces, using utensils
- Automatic processing is faster, but ignores the possibility to make changes

Divided Attention

- Ability to perform more than one activity at the same time
- More difficult when the tasks requires the same mental resources
  - Eg. Listening to 2 conversations at once
- Divided attention can be negative in the case of driving a vehicle because it increases accident rates
  - Drivers drive faster, leave less space, run into fixed objects, run into oncoming traffic

The Emotional Unconscious

- An amnesia patient can't remember new events; doctor shakes her hand with a pin in his palm; he tries to shake her hand again, and although she isn't consciously aware that she was pricked by the pin, she withdrew her hand
    - Unconscious events can influence behavior
- Chartrand and Bargh *subliminally* presented university students nouns that were either strongly negative, mildly negative, mildly positive, or strongly positive
    - Those shown with strongly negative nouns had the worst mood and those shown the positive nouns had the best mood
- This is known as the emotional unconscious

The Modular Mind

- Many view the brain as a collection of largely separated but interacting **modules**
- These parts of the brain perform tasks related to sensation, perception, memory, problem solving, emotion, motor behavior, etc
- The process information **parallel**: simultaneously and largely independent
- Our consciousness arises from the integrated activity of various modules

Circadian Rhythms: Our Daily Biological Clocks

- The daily biological cycles within 24 hours is known as the **circadian rhythm**

Keeping Time: Brain and the Environment

- The **suprachiasmatic nuclei (SCN)** in the **hypocampus** regulates most of the circadian rhythms
    - Work done by Martin Ralph
        - Moved healthy SCN neurons into animals who had their SCN destroyed
- SCN is linked to the tiny pineal gland which secretes **melatonin**, a hormone that has a relaxing effect on the body
    - SCN neurons become active during the daytime and reduce the pineal gland's secretion of melatonin, raising body temperature and heighten alertness
    - At night, SCN neurons become less active which allows melatonin levels to increase and promote relaxation and sleepiness
- SCN is sensitive to the environment
    - Increased light increases SCN activity and resets the 24 hour clock
- If you lived in the dark without light, you drift into a longer "natural" cycle of about 24.2 to 24.8 hours called a **free-running circadian rhythm**
- SCN neurons exhibit this long cycle of firing even if they are removed and grown in a petri dish
- Blind people can have out of sync circadian rhythms and have problems adjusting to the 24 hour world

Early Birds and Night Owls

- Early birds tend to do better in morning classes than night owls (higher grades)

Environmental Disruptions of Circadian Rhythms

- Gradual and sudden environmental changes can disrupt our circadian rhythms
- **Seasonal Affective Disorder (SAD)** is a cyclic tendency to become psychologically depressed during certain months of the year
    - May be due to sensitivity to light; the lack of light in the winter months cause them to still be in sleep mode when they wake up
- Jet lag is a sudden circadian disruption
    - Flying east you lose hours from the day
    - Flying west you gain hours

    - Causes insomnia, decreased alertness, and poorer performance until the body readjusts
- Even small changes in time, like springtime day light saving when you lose 1 hour, causes a small jump in likelihood of accidental death

Sleep and Dreaming

Stages of Sleep

- Approximately every 90 minutes, we cycle through different stages in which our brain activity and other physiological responses change in a generally predictable way
- **Beta waves** have a high frequency and low amplitude when you are awake and alert
- When you are drowsy, the brain slows down and **alpha waves** about 8 to 12 cps

Stages 1 to 4

- **Stages 1:** As sleep begins, your brain wave pattern becomes more irregular and slower *theta waves* increase (3.5 to 7.5 cps)
    - You're easily awaken in this stage
- As sleep gets deeper, **sleep spindles** are a period of 1 to 2 second bursts of rapid brain wave activity
    - Indicates that you are now in **stage 2**
- **Stage 2:** your muscles relax, breathing and heart rate are slower and you are harder to awaken
- **Stage 3:** appearance of very slow (0.5 to 2cps) and large **delta waves**
- **Stage 4:** when delta wave dominates
- Within 60 to 90 minutes, you go through the pattern 1-2-3-4-3-2
- Stages 3 and 4 are the **slow-wave sleep** where your body is relaxed, activity in the brain has decreased, and you are harder to awaken

REM Sleep

- Rapid Eye Movement sleep occurs every half a minute or so and causes bursts of muscular activity in the eye
    - When people are awakened in REM sleep, they almost always remember their dreams
- Heart rate quickens, breathing becomes more rapid and irregular, brain wave activity resembles that of active wakefulness
- Men have erections and women get wet
- Brain sends signals that make it more difficult for voluntary muscles to contract
- You get **REM sleep paralysis**
    - Called **paradoxical sleep** because your body is highly aroused, but it looks like you are sleeping peacefully because there is little movement
- There are non-REM dreams and REM dreams
    - REM dreams are vivid with sensory and motor elements and the perception of reality
    - Non-REM dreams are less story like, less vivid, focuses on static objects; also known as **sleep thoughts** because they are more like daytime thinking than dreams
- As time passes, stages 4 and stage 3 drop out and REM periods become longer (**see fig. 6.12)**

Getting a Night's Sleep: Brain and Environment

- The base of the forebrain (basal forebrain) and brain stem are especailly important in regulating our falling asleep
- The area where the reticular formation passes through the pons plays a key role in initiating REM sleep
    - This area directs other areas that control different aspects of REM sleep, such as

eye movements, muscular paralysis, and genital arousal
- Although biologically regulated, the environment plays a role as well
    - People sleep longer in the winter
    - Shiftwork, jetlag, stress at work and school, and nighttime noise decrease sleep quality

How Much Do We Sleep

- As we age we sleep less; infants 16 hours; 15 to 24 year olds 8.5hrs; elderly under 6 hours
- REM sleep decreases dramatically during infancy and early childhood
- Stages 3 and 4 declines and by late adulthood we get relatively little slow wave sleep
- Sleep time is dependent on genetic factors, some people function well on very little sleep
- On average, Canadians sleep 8.0 hours a night

Sleep Deprivation

- **Short term total sleep deprivation (up to 45 hours without sleep), long term total sleep deprivation (more than 45 hours without sleep), partial deprivation (no more than 5 hours of sleep per night for one or more consecutive nights)**
    - Participants reported their mood, mental ability, and physical abilities
- Mood suffers most of all, followed by cognitive then physical performance, although all three showed significant impairment from sleep loss
- Randy Gardner set a world record by not sleeping for 11 days; he became irritable, forgetful, nauseous and intensely tired; by day 5 he has disorientation and distorted thinking; in the last 4 days he developed finger tremors and slurred speech
- After long periods of sleep deprivation, we do not make up for all the sleep time that we have lost

Why Do We Sleep?

- **Restoration model** suggests that sleep recharges our run down bodies and allows us to recover from physical and mental fatigue
- Of normal people, exercising in a day only increases sleep for about 10 minutes
- Some researchers suggests that **adenosine** builds up as cellular waste and promotes the body to sleep
    - Caffeine blocks adenosine receptor sites and prevents them from signaling the brain to sleep
- **Evolutionary/circadian sleep models** suggests that in history, we hunt and gather food most efficiently in the day, and it wouldn't make much sense to go at night
- For small animals, they spend lots of time sleeping because they have safe shelters (eg. Tree trunks)
- For larger mammal that sleep in the open (eg. Horse) they spend little time sleeping because they need to run to get away
- Sleep might be a way to conserve energy because our metabolic rate is 10 to 25 percent slower when asleep
- Restoration and evolutionary models compliment each other
- **REM rebound effect:** the tendency for the brain the increase the amount of REM sleep after being deprived from it
    - Occurs in many species
- This shows that REM sleep is vital for learning and memory consolidation and may help strengthen neural circuits

Sleep Disorders

- 1/2 to 2/3 of adults feel like they have some sort of sleeping problem

Insomnia

- **Insomnia** is difficulty falling asleep, staying asleep, or experiencing restful sleep
- Trouble falling asleep is most common in young adults and staying asleep is most common in older adults
- **Pseudoinsomniacs** think they can't fall asleep for a long time when only very little time has passed
- Insomnia has biological, psychological, and environmental causes
    - Some are genetically predisposed to insomnia
    - Disorders such as depression, anxiety; general stress and jetlag
- Psychological treatment is called **stimulus control** where you use your bed as a stimulus to go to sleep and not for homework, TV, or anything else

Narcolepsy

- **Narcolepsy** involves extreme daytime sleepiness and sudden, uncontrollable sleep attacks that may last from 1 minute to an hour
- When sleep attacks occur they could go right into REM sleep
    - They can also experience cataplexy, a sudden loss of muscle tone often triggered by laughter, excitement, and other strong emotions; in severe cases knees buckle and the person collapses
    - They report a lower quality of life
- In humans, if one twin has narcolepsy the other has 30% chance of developing it as well
    - Signals genetic predisposition combined with an unknown environmental factor

REM sleep behavior disorder

- **REM sleep behavior disorder (RBD)** in which loss of muscle tone that causes normal REM sleep is absent
    - Woman singing during REM sleep

Sleepwalking

- Occurs in stages 3 and 4 of sleep
- They are usually unresponsive to other people, but seem vaguely conscious of the environment as they navigate around furniture, go to the bathroom or find something to eat
- Sleepwalking may be inherited, but daytime stress, alcohol, and other illnesses increase sleepwalking
- Awakening sleepwalkers is not harmful

Nightmares and Night Terrors

- **Night Terrors** are more intense than nightmares
    - They seem to wake up and scream, or flee to another room
- They usually have no recollection of it in the morning
- Night terrors occur mostly in deep sleep: stages 3 and 4

The Nature of Dreams

When Do We Dream?

- **Hypnagogic State:** The transition state from wakefulness through early stage 2
- 15 to 40 percent of sleepers report dreamlike activity when awakened within six minutes of falling asleep
- We dream more during REM sleep, where 80% dream activity is reported

What Do We Dream About?

- Dreams are not as strange as they are stereotyped to be and are usually involved in familiar settings involving people we know
- 80% of dreams involve negative emotions and half contained aggressive acts
- Women dream about men and women equally

- Men have about 2/3 male and 1/3 female in their dream
- Our cultural background, life experiences, and current concern shape our dreams
    - Eg. Children in Gaza dream more about persecution and aggression more often than their peers living in non violent areas

Why Do We Dream?

Freud's Psychoanalytic Theory

- Freud believed that the main purpose of dreaming is **wish fulfillment**, the gratification of our unconscious desires and needs
    - Distinguishes between the **manifest content**: the surface story and the **latent content:** the disguised psychological meaning
- This view is generally rejected because there is no evidence that there is a disguised meaning or hidden conflicts
- It is also highly subjective to the analyst's point of view

Activation synthesis theory

- This theory states that dreams serve no special purpose and that our cerebral cortex interprets the random neural activity caused by
    - This does not match any external sensory events but our brain continues to interprets the information
- Critics claim that activation-synthesis theory overestimates the bizarreness of dreams
- It also doesn't explain non REM dreams

Cognitive Approaches

- The **problem solving dream model** claim that dreams can help us find creative solutions to our problems and conflicts because they are not constrained by reality
    - Divorced women that have strong feelings and incorporate the stressor directly into dreams appear to work through their depression more successfully
- **Cognitive Process Dream Theories** focus on the process of how we dream
    - They are based on the modular model of consciousness
    - They suppose that dreaming and conscious thoughts are produced by the same mental systems in the brain
- There is a great similarity between dreaming and waking mental activity
    - In dreaming there is usually a rapid shift in content which is similar to conscious thinking

Toward Integration

- Many theorists began to integrate concepts from cognitive, biological, and modern psychodynamic perspectives
- Epstein views the unconscious mind as an information processor that weaves input from different brain modules into a coherent story while we dream

Daydreams and Waking Fantasies

- Daydreams provide stimulation during periods of boredom and let us experience positive emotions
- People who have a **fantasy prone personality** often live in a vivid, rich fantasy world that they control
- In a study, people with fantasy prone personality could achieve orgasm just by fantasizing about sexual activity
- Daydreams tend to have greater visual imagery, and tend to be less bizarre and emotional than nighttime dreams
- They usually reflect personal concerns

Drugs and Altered Consciousness

Drugs and the Brain

- Drugs get into the capillaries where they head to the brain

- The **blood-brain barrier** filters out foreign substances and allow nutrients to pass through, but sometimes substances can get through
- Drugs can alter consciousness by facilitating or inhibiting synaptic transmission

How Drugs Facilitate Synaptic Transmission

- An agonist is a drug that increases they activity of a neurotransmitter
- An agonist may enhance production, storage, or release of a neurotransmitter; activate the postsynaptic receptor; or prevent the neurotransmitter from being deactivated
    - Eg. Opiates attaches to sites that usually accept endorphins to relieve pain
    - Amphetamines cause neurons to release dopamine and norepinephrine even if they don't fire and blocks the reuptake of the these transmitters; this allows the dopamine and norepinephrine to remain the synapse and keep stimulating the postsynaptic neuron

How Drugs Inhibit Synaptic Transmission

- A drug that inhibits or decreases the action of a neurotransmitter is called an antagonist
- They can reduce the synthesis, storage, or release of a neurotransmitter, or prevent a neurotransmitter from binding to its receptors on the postsynaptic neuron
- Eg. A drug that treats schizophrenia by binding to the postsynaptic neuron that prevents dopamine from binding to the site

Tolerance and Withdrawal

- **Tolerance** is when a drug is used repeatedly, the intensity of effects produced by the same dosage may decrease over time
- Eg. If a drug causes you to increase your heart rate, your brain will respond by trying to keep heart rate down
- This adjustment is called **compensatory response**
- If you suddenly stop using a drug, your body's compensatory responses continue, and you will experience strong reactions opposite to those produced by the drug
    - This is known as **withdrawal**

Learning, Drug Tolerance, and Overdose

- The environment can have an effect on the body's compensatory responses through a learning process called **classical conditioning**
- Physical settings trigger progressively stronger compensatory responses, increasing the user's tolerance
- This could pose a danger because if take the drug in an unfamiliar location, your compensatory response is not at full strength which makes it easier for you to overdose
    - Eg. Heroin addicts who experienced near fatal overdoses did it in unfamiliar environments

Myths about Drug Addiction ad Dependence

- **Substance dependence** represents a maladaptive pattern of substance use that causes a person significant distress or substantially impairs that person's life
- **Physiological dependence** is when drug tolerance or withdrawal symptoms have developed
- **Psychological dependence** is when a craving is caused by pleasurable effects
- Myth 1: drug tolerance always lead to significant withdrawal
    - No, marijuana abuse causes increased tolerance but no withdrawal effects
- Myth 2: Physiological dependence is the major cause of drug addiction
    - People become highly dependent on cocaine even though they have mild withdrawal; their pleasurable effects is produced by boosting dopamine activity

    - Many drug user who make it through withdrawal eventually start using again
    - Drug dependence is influenced by genetic predisposition, personality traits, religious beliefs, peer influence, and cultural norms

Depressants

- Decrease nervous system activity
- In moderate doses, they reduce feelings of tension and anxiety, and produce a state of relaxed euphoria

Alcohol

- Alcohol increases the activity of **GABA**
    - By increasing the action of an **inhibitory** neurotransmitter, alcohol dampens down neural firing
- It also decreases the activity of glutamate, which is a major **excitatory** neurotransmitter
- This causes the slowdown of the inhibitory control centers in the cerebral cortex, so you become less inhibited
- However, higher dosage can cause disorganized mental and physical coordination, and fatigue and psychological depression may occur
- This is why there is an "upper" and "downer" phase to alcohol
- The **blood alcohol level** (BAL) is a measure of alcohol concentration in the body
- Increased BAL causes reaction time, eye-hand coordination, and decision making to become impair
    - 40% of deaths from traffic accidents are alcohol related
- In addition to lessened inhibition, you can get **alcohol myopia** where a shortsightedness in thinking caused by the inability to pay attention to as much information as sober peple
- Drinkers don't think about long term consequences as often

Barbiturates and Tranquilizers

- Barbiturates are sleeping pills
- Majority of tranquilizers and barbiturates are made to increase the activity of the inhibitory neurotransmitter GABA
- Mild doses of barbiturates are effective as sleeping pills, but are highly addictive
- At high doses barbiturates trigger initial excitation, followed by slurred speech, loss of coordination, depression, and severe memory impairment
- Overdose can cause unconsciousness, coma and death

Stimulants

- **Stimulants** increase neural firing and arouse the nervous system; they increase blood pressure, respiration, heart rate, and overall alertness

Amphetamines

- They are prescribed to reduce appetite and fatigue, decrease the need for sleep, and sometimes to reduce depression
- Amphetamines increase dopamine and norepinephrine activity
- In large quantities they can cause a sudden energy surge and intense pleasure and can remain awake for up to a week
- Blood pressure increases due to amphetamines can cause heart failure and cerebral hemorrhage
- In schizophrenia, hallucinations and delusions are associated with excess dopamine activity
- Using amphetamines cause schizophrenia like hallucinations and paranoid delusions, a reaction called **amphetamine psychosis**

- Crystal meth is a common form of amphetamines and causes irritability, insomnia, loss of REM sleep, hyperactivity, confusion, hallucinations, anxiety, paranoia, and increased aggression
- MDMA (ecstasy) is a derivative of amphetamine
    - It causes the release of serotonin and blocking its reuptake
    - It produces short and long term cognitive impairment, especially on language tasks such as tests of verbal fluency
- It also causes in memory and attention deficits, sleep disturbances, sexual dysfunction, and impaired immune responses
- It also increases body temperature

Cocaine

- Powder derived from the coca plant and is usually in powder form
- It increases muscular strength and euphoria
- Works by increasing the activity of norepinephrine and dopamine by blocking their reuptake
- In large doses, it can cause fever, vomiting, convulsions, hallucinations, and paranoid delusions
- **Crack** is an altered form that can be smoked and it is faster, more intense and more dangerous

Opiates

- Include morphine, Codeine, and heroin and comes from the opium poppy
- They provide pain relief
- Can cause mood changes which may include intense euphoria
- Oxycodone is a powerful painkiller but widely abused for its mood altering effects
- You get a pleasurable rush
- High doses can cause reduced breathing, lead to coma or death
- There are intense withdrawals from this drug

Hallucinogens

- Include mescaline from peyote cactus; psilocybin from mushrooms; LSD and PCP
- They usually intensify sensory experience and sense become mixed up
- LSD is a powerful hallucinogen; small doses can cause very long highs

Marijuana

- Product of the hemp plant
- Most widely used illicit drug in Canada
- **THC** is marijuana's major active ingredient and binds to receptors on neurons throughout the brain
    - It binds to sites that usually bind **cannabinoid**
- With chronic use, THC may increase GABA activity which slows down neural activity and produces relaxing effects
- It also increases dopamine activity
- A myth is that it causes people to have amotivational syndrome
- Another myth is that marijuana will cause people to start using more dangerous drugs
- A third myth is that using marijuana has no significant dangers
    - It has more carcinogens than cigarette smoke
- About 10 percent of users develop dependence

From Genes to Culture: Determinants of Drug Effects

- Biological, psychological, and environmental factors can influence the drug experience
- Genetic factors influence sensitivity and tolerance to drug effects
    - Eg. Some rats have greater tolerance to alcohol than others
- Identical twins have a higher concordance rate for alcoholism than fraternal twins

- Offspring of alcoholic parents typically display faster hormonal and psychological reactions as blood alcohol levels rises, but these responses drop off more quickly as blood alochol levels decrease
    - They need to drink more over the course of a few hours to maintain their intoxication
- Cross fostered rat pups raised by an alcohol consuming mother tend to drink more alcohol than rat pups raised by mothers who do not drink alcohol
- Both genetics and alcoholic parents paly a role in increased risk of alcohol abuse
- Compensatory physiological responses to a drug depend on the environment
- Cultures also affect people's reaction to alcohol
    - In Western cultures, violence and sexual promiscuity is common
    - In other cultures, people are non violent and cordial while drunk
- People's beliefs and expectancies can influence drug reactions
    - People think they are drunk even if its just a placebo

Hypnosis

- Anton Mesner came up with **animal magnetism** where he cure psychological and physical disorders by use of magnets
    - Later found that it was actually hypnosis, a state of nervous sleep

Scientific Study of Hypnosis

- **Hypnosis** is a state of heightened suggestibility in which some people can imagine suggestions to be real
- **Hypnotic induction** is the process by which one person leads another person into hypnosis
    - This causes the subject to relax but concentration to increase at the same time
    - You cannot be hypnotized against your own will
- **Hypnotic susceptibility scales** contain a standard series of pass/fail suggestions that are read to a subject after a hypnotic induction
    - About 10% are completely nonresponsive while another 10% pass nearly all items
- Hypnotic susceptibility is a stable characteristic
    - Susceptibility can be enhanced by people's expectation that they have the ability to be hypnotized

Hypnotic Behaviors and Experiences

Involuntary Control Behaving Against One's Will

- Hypnotized people subjectively experience their actions to be involuntary
    - Eg. They believe that external forces are present even though they are not
- This behavior may be due to the participants own expectations as the instructions come from a highly authoritative figure

Physiological Effects and Physical Feats

- Eg. When people were told to run an allergenic leaf against their skin during hypnosis, 4 of 5 showed no symptoms; when they were told that a regular leaf was allergenic and they rubbed it against their skin, all 5 had allergic reactions
- However, when blindfolded people were exposed to the allergenic leaf, they showed no symptoms; conversely when you were rubbed with a nontoxic leaf and were told it was toxic, they showed allergenic reactions
- Under hypnosis, nearsighted people can see more clearly, warts can be cured, and stomach acidity can be increased
    - But these can be shown in normal people as well

Pain Tolerance

- James Esdaile performed 300 major operations with using hypnosis as the sole anaesthetic
    - Needed an average of only 11 minutes to produce **analgesia**, absence of pain
- Hypnosis can provide chronic pain relief for several months
    - But other techniques such as mental imagery also produce similar effects

Hypnosis and Memory

- In one case, a math teacher is led to believe that the number 6 is disappeared
- 25% of hypnotized university students can be led to experience amnesia

Theories of Hypnosis

Dissociation Theories: Hypnosis as Divided Consciousness

- **Dissociation theories** views hypnosis as an altered state involving a **division of consciousness** in which the person simultaneously experience two streams of consciousness that are cut off from one another
- One stream responds to suggestions, the other stream remains in the background but is aware of everything that goes on
    - This part of consciousness is known as the **hidden observer**
- Eg. If given the suggestion that "your arm will start to feel lighter and will begin to rise," the subject intentionally raises the arm, but only the hidden observer is aware of it, the main stream of consciousness is blocked from this awareness

Social Cognitive Theories: Roles and Expectations

- Proposes that hypnotic experiences result from expectations of people who are motivated to take on the role of being hypnotized
    - People associate hypnosis with a trancelike appearance, responsiveness to suggestion, and a loss of self consciousness
- University students were told that hypnosis is associated with spontaneous stiffening of the muscles in the dominant hand
    - Later on, 55% of the subjects exhibited stiffening of the hand without any suggestion from the hypnotist
    - Control group showed no stiffening of the hand
- Our expectations affect what we perceive and our responses

Some Final Thoughts

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Chapter 7:Learning and Adaptation: The Role of Experience

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- **Learning** is a process by which experience produces a relatively enduring change in an organism's behavior or capabilities

Adapting to the Environment

- Learning is a process of personal adaptation to the ever-changing circumstances of our lives

How Do We Learn? The Search for Mechanisms

- Behaviorists observed that many different species of animals responded in predictable ways to a pattern of reward or punishment
    - Treated organisms as *Tabula rasa*, upon which learning experiences were inscribed
    - Explained purely on directly observable events

Why Do We Learn? The Search For Functions?

- **Ethology** focuses on animal behavior within the natural environment
- Argues that animals are not blank slates and that every species comes into the world biologically prepared to act in certain ways
- Focused on the functions of behavior, particularly its **adaptive significance**
- Newly hatched herring gull pecking at the red dot on the parents beak to ask for food is prewired into the herring; they will peck at any red dot even if it's not their parents
    - This is known as a **fixed action pattern**
- Fixed action patterns can be modified by experience
    - Eg. Older herrings can tell if it is an adult herring or not and will not peck at inanimate red dots
- Buntings are prewired to migrate by following a fixed star, but it has to learn which specific star is fixed by observation and experience

Crossroads of Learning: Biology, Cognition, and Culture

- Environment shapes us through **personal adaptation** and **species adaptation**
    - Personal adaptation occurs through the laws of learning that the behaviorists examined
    - It results from our interactions with immediate and past environments
- The environment plays a role in species adaptation
    - Environmental conditions faced by each species help shape its biology
    - Learned behavior is not passed onto the offspring
- Species capable of learning can adapt to changing environmental conditions or expand into new an different environments
    - The ability to learn is passed through genetics
- Theorists propose that in response to environmental demands faced by our ancestors millions of years ago, the human brain acquired the capacity to perform psychological functions that have adaptive value and enable us to learn
- Since many species face similar adaptive challenges, one can expect similarity in the library of learning mechanisms
- Every organism must learn:
    - Which events are, or are not, important to its survival and well-being
    - Which stimuli signal that an important event is about to occur

    - Whether its responses will produce positive or negative consequences
- Each learning mechanism helps us repond to one or more of these adaptive challenges
- Cognitive psychologists have continued to challenge the behaviorists assumption that learning does not involve mental processes
- Social customs also affect how we learn since culture is the man-made part of the environment

Habituation

- **Habituation** is a decrease in the strength of response to a repeated stimulus
- It is adaptive because if an organism responded to every stimulus in its environment, it would rapidly become overwhelmed an exhausted
    - Learning not to respond allows the organism to conserve energy and focus its attention on other stimulus
- This is different from sensory adaptation because you are still receiving stimuli, except your nervous system has chosen to ignore it

Classical Conditioning: Associating One Stimulus with Another

- **Classical conditioning** is where an organism learns to associate two stimuli, such that one stimulus comes to produce a response that was originally produced by another stimulus
    - It is a basic form of learning tha toccurs in many animals
    - Involves **learning an association** between stimuli

Pavlov's Pioneering Research

- Dogs salivate to food, however, after a while, they would salivate to sounds that they heard before they got the food
- Classical conditioning alerts organisms to stimuli that signal the impending arrival of an important event

Basic Principles

Acquisition

- Refers to the period during which a response is being learned
- If you ring a bell to a dog, nothing would happen, because the bell is a **neutral stimulus** and would not cause salivation
- Putting food into a dog's mouth would cause the dog to salivate because it's reflexive
    - Food is an **unconditioned stimulus**
    - Salivation is an **unconditioned response**
- The tone and the food become paired several times and is known as a **learning trial**
- After several learning trials, the tone is presented by itself and the dog salivates even though there is not food
    - The tone becomes a **conditioned stimulus**
    - Salivation becomes a **conditioned response**
- Conditioned stimulus must be paired multiple times with a unconditioned stimulus to establish a strong conditioned response
- A tone becomes a conditioned stimulus more quickly if greater amounts of food was given afterwards
- One trial pairing: CS-UCS stimulus pairs after one trial
- **Forward short-delay pairing**: the CS appears first, followed by the UCS with the CS still present; learning occurs most quickly
- **Forward trace pairing**: CS would come on and off, and after then the UCS would be present
- **Simultaneous pairing**: CS and UCS come on together; least effective

- **Backward pairing**: UCS is presented before the CS

Extinct and Spontaneous Recovery

- If CS is presented repeatedly in the absence of UCS, then the CR weakens and eventually disappears
    - This is known as **extinction**
- Occasional repairing of CS and UCS are usually required to maintain CR
- The key ingredient to extinction is not merely passage of time, but repeated presentation of CS without UCS
- **Spontaneous recovery** is defined as the reappearance of a previously extinguished CR after a rest period

Generalization and Discrimination

- Once a CR is acquired, organisms often respond not only to the original CS but also to stimulus that are similar to it
    - Greater similarity = greater chance that CR will occur
- **Generalization:** stimuli similar to the initial CS elicit a CR
- Stimulus generalization serves critical adaptive functions
    - Eg. Rattling in the bush caused an attack; if the animal cannot generalize it will only respond to an identical rattle in the bush for it to respond
- To prevent stimulus generalization from running amok, organisms must be able to discriminate differences between stimuli
- **Discrimination** is demonstrated when a CR occurs to one stimulus but not others

Higher-Order Conditioning

- When a neutral stimulus becomes a CS after being paired with an already established CS (fig. 7.8)
- It is usually weaker and extinguishes more quickly

Applications of Classical Conditioning

Acquiring and Overcoming Fear

- **John B. Watson**
    - Infant Albert was shown a rat which he was not afraid of
    - Albert was afraid of loud noises; loud noises were made as the rat was shown to him
    - Eventually the rat alone made Albert cry
- Albert became of furry white or grey objects
- **Exposure Therapies** is to expose the patient to the feared stimulus (CS) without any (UCS)
- **Systematic desnsitization** is patients learn muscle relaxation rechniues and then is graduatlly exposed to the fear-provoking stimulus
- **Flooding** is immediate exposure to the phobic stimulus

Conditioned Attraction and Aversion

- People become more sexually aroused to various stimuli after those CSs have been paired with sexually arousing UCSs
- **Aversion therapy** attempts to condition an aversion to stimulus that triggers unwanted behavior by pairing it with a noxious UCS
    - Reducing alcoholic's attraction to alcohol, the patient is given a drug that induces nausea when alcohol is consumed
    - Mixed results; often leads to short term effects and extinction over time

- Neutral stimuli can acquire favorable or unfavorable meaning by pairing it with other stimuli that laready has a positive or negative attitude

Operant Conditioning: Learning through consequences

- Operant conditioning is not a elicited response that is automatically triggered by some stimulus

Thorndike's Law of Effect

- A cat was put into a box with food placed outside of it
- There is a lever that must be pushed to open the door so the cat can get to the food
- The cat first tries pulling on the fence, pacing around, digging in the floor, and eventually stumbled upon the lever by chance and the door opens
- Over time, the cat eventually learned that pulling the lever=opening the door
    - Performance improved
- The animal did not show insight, but instead learned using trial and error
    - This process is known as *instrumental learning*
- **Law of effect** stated that in a given situation, a response followed by a satisfying consequence will become more likely to occur

Skinner's Analysis of Operant Conditioning

- B.F. Skinner coined Operant behavior which states that an organism operates on its environment in some way
- **Operant conditioning** is a type of learning in which behavior is influenced by its consequences
- Skinner viewed operant conditioning as a type of natural selection that facilitates an organism's personal adaptation to the environment
- **Skinner Box:** a box with a lever that dispenses food
    - The rat first pushes it accidentally but pushes it more frequently over time
- **Reinforcement:** a response that is strengthened by an outcome that follows it
    - The outcome the reinforces the behavior is called the **reinforcer**
- **Punishment:** occurs when a response if weakened by outcomes that follow it
    - If the lever causes an electric shock, it will make the rat not want to press it

ABCs of Operant Conditioning

- Skinner's analysis of operant behavior involves 3 kinds of events
    1. Antecedents: stimuli that are present before a behavior occurs
    2. Behaviors: in which the organism emits
    3. Consequences: follows behavior
- Relationship between A and B and B and C are called **contingencies**

Differences between classical conditioning and operant conditioning

- In classical conditioning the organism learns an association between two stimuli
    - In operant conditioning the organism learns the association between behavior and its consequences
- Classical conditioning focuses on elicited behaviors
    - Operant conditioning focuses on emitted behaviors

Antecedent Conditions: Identifying When to Respond

- If there is a light above the lever in the Skinner Box, and only dispenses food when the light is on, the rat will only press it when the light is on
- The light becomes a **discriminative Stimulus** which signal a particular response

Consequences: Determining How to Respond

Positive Reinforcement

- A behavior causes reward and results in increased behavior
    - Eg. Cat presses a lever; food pellets appear; lever pressing increases
- Reward is used synonymously with positive reinforcement

Primary and Secondary Reinforcers

- **Primary reinforcers** are stimuli such as food and water that an organism naturally finds reinforcing because they satisfy biologicla needs
- Through association with primary reinforcers, other stimuli can become **secondary**, or **conditioned reinforcers**
    - Eg. Money, positive performance feedback, etc

Negative Reinforcement

- A response is strengthened by the subsequent removal or avoidance of a stimulus
    - The removed stimulus is known as the negative reinforcer
    - Eg. Taking aspirin; headache goes away; increased tendency to take aspirin for headache relief

Operant Extinction

- Weakening and eventual disappearance of response because it is no longer reinforced
    - Eg. If pressing a lever does not yield food any more, then the rat would eventually stop doing it
- Degree of non-reinforce behavior persisting is called **resistance to extinction**
    - Low resistance: non reinforced behavior disappears quickly
    - High resistance: non reinforced behavior keeps going
- Pascal was a misbehaving child that did not respond to reason, verbal punishment, or physical punishment
    - This is because what Pascal wanted the most was attention

Positive Punishment

- A response is weakened by the subsequent presentation of a stimulus
    - Child misbehaves; child is beat in the face; child is less likely to do it again
- Often produces rapid results
- It has important limitations because it does not cause the organism to forget how to make the response
- It may not be generalized to general situations
    - Eg. Maybe a child will only stop using bad words when parents are present
- Can cause dislike of the person delivering the punishment
- Physical punishment can send the message to the recipient that aggression is okay

Negative Punishment

- A response is weakened by subsequent removal of a stimulus
    - Running a red light; causes a monetary fine; decreased chance of running the light again
- Different from operant extinction
    - Operant extinction: the very desired stimulus is removed
    - Negative punishment: removal of some other stimulus that did not cause the behavior
        - Eg. Depriving a misbehaving child of TV; although the TV had nothing to do with the child misbehaving in the first place
- It is better than positive punishment because
    1. Less likely to create strong fear or hatred toward the punishing agent
    2. Punishing agent is not modeling physical aggression so it is not likely to be copied

Immediate versus Delayed Consequences

- Reinforcement or punishment that occurs immediately after a behavior has a stronger effect than when it is delayed
- **Delay of gratification:** ability to forego an immediate but smaller reward for an delayed but more satisfying one
    - Not having $100 now but getting $200 in a month
- Delay of gratification usually develop around preschool years
- People who have lesser ability to do so have a less quality of life
    - Eg. Using drugs

Shaping and Chaining: Taking One Step at a Time

- Eg. Getting mark to be more active on the playground
    - Get him to play on the moneky bars
    - Use attention as a positive reinforcer when mark goes to play there
    - You'd have to wait a long time because Mark doesn't go there often
- Skinner developed **shaping**, which involves reinforcing successive approximations toward a final response
    - Reinforce Mark when he stands up, when he walks over to the monkey bars, and finally when he starts playing there
    - This is called the **method of successive approximations**
- **Chaining** is used to develop a sequence of responses by reinforcing each response with the opportunity to perform the next response
    - Eg. Ringing a bell turns the light above the lever on; when the light is on food will be dispensed; the rat pushes the lever afterwards to release food
    - Usually backwards toward the first response

Generalization and Discrimination

- **Operant generalization** is when an operant response occurs to a new antecedent stimulus or situation that is similar to the original one
    - A young child not touching all stovetops after getting burned by one of them
- **Operant Discrimination** means that an operant response will occur to one antecedent stimulus but not another
    - The antecedent stimulus is known as the discriminative stimuli
- **Operant discrimination training:** making an discriminate certain stimuli that it does not discriminate before
    - Eg. Only when a green light is on, will food be dispensed; eventually the rat will only push the lever when a green light is on and has discriminated against the other colors

Schedules of Reinforcement

- **Continuous reinforcement** schedule is when every reponse of a particular type is reinforced
    - Every press of the lever results in food pellets
    - Every quarter in the coke machine results in a can of coke
- **Partial reinforcement** is when only some responses are reinforced
    - Can be divided into ratio and interval schedules
- **Ratio schedules:** a certain percentage of responses is reinforced
    - The rat's lever only dispenses food 50% of the time
- **Interval schedule:** a certain amount of time must elapse between reinforcements, regardless of how many correct responses might occur during that time

    - Eg. The lever only dispenses food every minute

Fixed-Ratio Schedule

- Reinforcement is given after a fixed number of responses
    - Eg. FR-3 means that reinforcement occurs after every third response
- Some businesses pay employees for each item produced
    - This results in greater work output than hourly wages

Variable-Ratio Schedule

- Reinforcement is given after a variable number of correct responses
    - Eg. VR-3 means that on average, three responses are required for reinforcement
- Produces high rate of responding
- Less pausing after reinforcement because the next response might be reinforced
- Eg. Gambling

Fixed-Interval Schedule

- First correct response that occurs after a fixed time interval is reinforced
    - Eg. FI-3 means that after a lever is pressed, it will only dispense food again after 3 minutes regardless of how many times the lever is pressed within the 3 minutes

Variable-Interval Schedule

- Reinforcement is given for the first response that occurs after a variable time interval
    - Eg. VI-3 means that on average, there is a 3 minute interval between opportunities to obtain reinforcement
- Because availability is less predictable than an FI schedule, te VI schedule produces a steadier response rate
- Eg. Pop quizzes because they are given on average every 1 to 2 weeks

Partial Reinforcement, Learning, and Extinction

- Continuous reinforcement produces more rapid learning than partial reinforcement because the association between behavior and its consequences is easier to perceive
    - Easier to extinguish because the shift to no reinforcement is sudden and easier to perceive
- Partial reinforcement is learned more slowly but more difficult to extinguish especially if it's on a variable schedule
    - Since it's unpredictable, it takes longer to learn that it is gone forever
- The best way to promote fast learning is to begin by reinforcing the desired behavior on a continuous schedule until it's well established; then move on to partial schedule that is gradually made more demanding
    - Eg. Mark playing on the monkey bar
        - First you reinforce him constantly for playing on the monkey bar
        - Then you gradually decrease the reinforcement until he is willing to play after occasional attention from the teacher

Escape and Avoidance Conditioning

- In **escape conditioning,** organisms learn a response to terminate an aversive stimulus
    - Acquired and maintained through negative reinforcement
    - Putting a sweater on is negatively reinforced by the desirable consequences that you no longer shiver
- **Avoidance conditioning** is when an organism learns a response to avoid an aversive stimulus
    - It is usually hard to extinguish
        - Eg. Emily's snake phobia; she continues to avoid snakes even though the

intense pain from her accident is no longer experienced

- **Two-factor theory of avoidance learning**
  - Neutral stimulus is paired with UCS so that the neutral stimulus becomes with CS
  - Operant conditioning takes over, fleeing from the light is negatively reinforced by the termination of fear
    - This strengthens and maintains the response
- Extinction is difficult because the subject doesn't hang around to see if the CS actually does cause aversive effects
  - Emily is not likely to go near a snake to see if it injures her
- Some stimuli (such as snakes) causes phobia more easily than others (rabbits)

Applications of Operant Conditioning

Training Animals

- Through shaping and chaining, animals can learn to perform some truly remarkable behaviors
  - Eg. Training bomb sniffing dogs
- In air-sea rescues, pigeons were trained to peck at a key when they see an orange object; 3 pigeons covered a 360 degree view, and the frequency of pecking allows the pilot to pinpoint the rescue location

Human Applications: Education, the Workplace, and Beyond

- Educational software combines immediate performance feedback and self-pace learning
- The environment is not providing the proper consequences to reinforce the desired behavior
- Skinner claims that poor society performance is that the environment is not providing the proper consequences to meet performance goals
- **Token economies** is where desirable behaviors are quickly reinforced with tokens which can be later cashed in for tangible goods
- Skinner gave rise to a field called **applied behavior analysis** which combines a behavioral approach with the scientific method to solve individual and society problems
  - Program implemented to change behavior

Biology and Learning

- Martin Seligman's concept of "preparedness" captures the idea that animals aren't willing to perform all behaviors
- **Preparedness** is that through evolution, animals are biologically "prewired" to easily learn behaviors related to their survival as a species

Constraints on classical Conditioning: Learned Taste Aversions

- Combining the smell and taste of food (CS) with a toxin or some illness producing agent (UCS) can produce a CR called **conditioned taste aversion**
- John Garcia challenged classical conditioning, which assumed that UCS-CS has to be presented within a short time frame; usually a few seconds
  - However, Garcia showed that animals learned taste aversions even though food (CS) was consumed up to several hours before they become ill
- In another experiment, Garcia exposed 3 neutral stimuli: a light, a buzzer, and water and also exposed them to X-ray which made them sick later on
  - The rat only avoided the water but not the buzzer or the light
  - This shows that rats are genetically primed to associate sickness and water

- In a third experiment, the water, the light, and the buzzer were paired with electric shock
    - The rat avoided the light and the buzzer but did not avoid the water
    - In nature, sights and sounds signal fear-provoking behavior so this makes sense
- Psychologists have created taste aversions in nature
    - Sheep meat was put into sheep hide and was laced with an illness inducing drug; coyotes came and at the fake sheep and became sick; this makes them less likely to eat real sheep and saving their lives

Are We Biologically Prepared to Fear Certain Things?

- Seligman proposed that humans are biologically prepared to acquire certain fears more readily than others
    - Even though Emily was injured by a car, she became afraid of snakes
- In an experiment, when people were shocked while looking a pictures of spiders, snakes and angry faces, they were much more likely to develop a CR to these things
- If the picture displayed were flowers, houses, or happy faces, then the CR is much more difficult to be conditioned
- We tend to fear things that seem to have a greater evolutionary significance

Constraints on Operant Conditioning: Animals That "Won't Shape Up"

- Sometimes animals simply refused to behave according to the rules of operant conditioning
- **Instinctive Drift:** a conditioned response "drifts back" toward instinctive behavior
- Operant learning is contrained by biology

Learning and the Brain

- Some brain regions, such as the nucleus accumbens, and certain neurotransmitters, such as dopamine play a key role in regulating the ability to experience reward

Cognition and Learning

- In operant conditioning there is the stimulus and response
- In the cognitive model of learning, the organism's mental representation of the world goes between stimulus and response

Insight and Cognitive Maps

- Kohler claimed that chimpanzees can learn by **insight**, the sudden perception of a useful relationship that helps to solve a problem
    - Eg. Chimp stacking boxes to reach a banana
- Tolman ran an experiment that first allowed a rat to follow a path from the start to goal (which contains food)
    - Then, many additional paths were given
    - The rat explores these paths briefly, but eventually chose the original, correct path, to get to the food
- The rat had developed a **cognitive map**

Cognition in Classical Conditioning

- Cognitive theorists believed that the CS linked to the UCS first to produce the response and that the CS does not directly cause CR
- This *expectancy model* states that the most important factor in classical conditioning is not how often the CS and UCS but how well the CS predicts the appearance of the UCS
- A tone is played when the rats were shocked by electricity, but they were also shocked when the tone isn't played
    - The rats did not develop a fear response from the tone because the tone doesn't reliably predict the shock

- This is why we don't get conditioned to random stimuli
    - Eg. Why does Pavlov's dog not salivate when the light is on since food is always given in a lit room
        - The room is more often lit, and food is not given; it doesn't predict the UCS effectively

Cognition in Operant Conditioning

The Role of Awareness

- Organisms develop an awareness or expectancy of the relations between their responses and probable consequences
- One would only increase their behavior if they are aware that they that their behavior is being reinforced
- The concept of awareness implies that the best predictor of behavior is the perceived contingency, not the actual one
    - For example, when a child tell his mother to pass the fucking cereal, the mother gets furious; the child assumes that it's because he wants cereal and not because he used a bad word

Latent Learning

- Eg. 3 groups of rats running in a maze
    - Group 1 is given food in the goal box
    - Group 2 finds the goal box empty when they reach it
    - Group 3 finds no food for the first 10 days but finds food starting on day 11
- Group 3 figured out that there is food on day 11, and on day 12, he became just as good as group 1 who has been reinforced all along
- This phenomenon is known as **latent learning** which refers to learning that occurs but is not demonstrated until there is an incentive to perform
- The rats learned how to solve the maze, but does not display that knowledge until there is a benefit in doing so

Self-Evaluations and Reinforcers andPunishers

- People make their own standards that may or may not fit into external reinforcement
    - One could do something ridiculous and no one would like it, but he could find self accomplishment by doing so

Observational Learning: When Others Pave the Way

- Learning that occurs by observing the behavior of a model
    - Eg. Driving, doing math, making a sandwich
- Observational learning is highly adaptive: an organism can learn which events are important, which stimuli signal that such events are about to occur, and which responses are likely to produce positive or negative consequences
    - Monkeys may learn adaptive fears - such as fear of snakes - by observing other monkeys' reactions
- Our capacity to learn by observation is called modelling
    - Helps us bypass the potential danger of trial and error
- People are imitate those who are more competent, likable, and have higher status or social power

The Modeling Process

- Cognitive process involves 4 basic steps
    1. Attention: pay attention to the model's behavior
    2. Retention: retain information in memory so that it can be recalled at a later time

3. Reproduction: must be physically able to reproduce the models behavior
4. Motivation: we must be motivated to demonstrate the behavior

- TV violence has strong correlation with:
    - Decreased concern about the suffering of victims
    - Habituates us to the sight of violence
    - Provides aggressive models that increase the likelihood of aggression

Chapter 8 Memory

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- **Memory** refers to the processes that allow us to record an later retrieve experiences and information

Memory as Information Processing

- **Encoding** refers to getting information into the system by translating it into a neural code that your processes
- **Storage** involves retaining information over time
- **Retrieval** is when you want to pull out the information out of storage for use

A Three Component Model

- Memory has 3 major components: sensory memory, short term memory, and long term memory
    - Sensory input causes **sensory register**
    - The sensory register encodes the information and brings it into the **working (short term) memory**
    - The short term memory is encoded again into the **long term memory**
    - Memories can be retrieved from the long term memory into the short term memory

Sensory Memory

- Holds incoming sensory information long enough so that it can be recognized
- The visual sensory register is called the iconic store
    - It can hold images for more than a fraction of a second
- The auditory sensory register is called the echoic store
    - Lasts for 2 to 3 seconds

Short-Term/Working Memory

- Through selective attention, a small portion of sensory memory enters the **short term memory**
    - Referred to as **working memory**
- The sensory register must create a mental representation in your mind
    - We may try to form a mental image (visual encoding), code something by sound (phonological encoding), or focus on the meaning of a stimuli (semantic encoding)
- Short term memory can hold only a limited amount of information
    - About 5 to 9 meaningful items
- The memory is concerned with the number of meaningful units
    - Eg. If you try to remember a jumble of letters vs meaningful words formed by the letters, memorize the jumble of letters will be much harder
- Combining individual items into larger units is called **chunking**
- Without rehearsal, the short term memory can last only about 20 seconds
- Simple repetition of information is called **maintenance rehearsal**
- **Elaborative rehearsal** focuses on the meaning of information or relating it to other things we know already
    - Better in transfer to long term memory
- Short term memory is a working memory that actively and simultaneously processes different types of information and supports other cognitive functions
    - Eg. Adding 2 numbers, the short term memory calls up the problem solving processes from the long term memory on how to add

- Alan Baddeley divides working memory into three components
    1. **Auditory working memory:** repeating a phone number, name, or new vocabulary terms
    2. **Visual Spatial Working Memory:** temporarily store and manipulate images and spatial information
    3. **Central Executive:** directs action
- Prefrontal cortex is heavily involved in directing the processing of information in the working memory

Long-Term Memory

- Long term memory capacity is essentially unlimited
- If presented a list of words, you are more likely to remember words presented in the beginning and the end of the list
- The **serial position effect** means that recall is influenced by its position of appearance in a series of items
    - **Primacy Effect:** superior recall of early words
    - **Recency Effect:** superior recall of most recent words
- According to the three stage model, The short term memory gets filled up by the words that keep coming in
    - It can rehearse them all, so the new words are not transferred into the long term memory
- The recency effect is because the last few words are not bumped out of the short term memory by any new information
    - If you were asked to wait 30 seconds after the last word and your mind is kept occupied doing something else, the recency effect disappears

Encoding: Entering Information

Effortful and Automatic Processing

- Effortful processing is encoding that is initiated intentionally and requires conscious attention
- Automatic processing is stuff that gets transferred into long term memory even though you have not consciously tried to encode it
    - Eg. Remembering where you saw a diagram is located on the page

Levels of Processing: When Deeper is Better

- Eg.
    1. POTATO "Is the word in capital letters?"
    2. Horse "Does the word rhyme with course?"
    3. TABLE "Does the word fit in the sentence, "the man peeled the ___?"
- Question 1 requires superficial **structural encoding** since you only have to notice how the word looks
- Question 2 requires **phonological encoding** by sound out the words and judging whether it rhymes with another word
- Question 3 requires **semantic encoding** because you have to pay attention to what the word means
- **Levels of Processing** states that the more deeply we process information the better it will be remembered
- Semantic coding requires the deepest level
    - Requires us to focus on the meaning of the information

Exposure and Rehearsal

- To learn factual or conceptual information, we need to employ effortful, deep processing

    - Repeated shallow exposure to a stimulus does not guarantee long term retention
- Maintenance rehearsal involves repetition and is most useful for keeping information active in short term, working memory but is an inefficient in transfer to long term memory
- Elaborative rehearsal focuses on the meaning of information and is more effective in transferring into long term memory

Organization and Imagery

- How does a waiter remember orders for large groups of people without writing them down
    - There are hundreds of possible course options possible
- He does so by using an organizational scheme

Hierarchies and Chunking

- Hierarchies helps the brain organize and remember information
- Each level of the hierarchy help trigger the ones below it
- Chunking refers to combining individual items into a larger unit of meaning
    - Eg. Chunking phone numbers into sets of 3 letters

Mnemonic Devices

- A type of memory aid
    - Eg. HOMES (the first letter of the five great lakes) and ROY G. BIV
- Does not reduce the amount of raw information to be remembered but reorganizes information into meaningful units

Visual Imagery

- Information stored in long term memory is stored in 2 forms: verbal codes and nonverbal codes
- **Dual coding theory** is encoding memory information using both codes help improve memory
    - Eg. Firetruck and light bulb appeals to both verbal and nonverbal codes because they can be visualized; however jealousy and knowledge can only be encoded verbally
- In the Method of Loci, you take a distinct sequence of landmarks in a familiar location to associate with something you want to memorize

How Prior Knowledge Shapes Encoding

Schemas: Our Mental Organizers

- A **schema** is a "mental framework" about some aspect of the world such as a class of people, events, situations, or objects
- Schemas create a context for remembering things and holds the information you perceive into a unified set

Schemas and Expert Knowledge

- Acquiring expert knowledge can be viewed as a process of developing schemas - mental frameworks - that help encode information
    - Eg. When 3 chess players ranging from beginner to expert skill level were asked to reconstruct the game board of 25 pieces after looking at it for 5 seconds
    - If it was constructed in a situation that might actually occur in a game
        - The expert was able to remember 16 pieces
        - The intermediate 8
        - The beginner only 4
    - If it was constructed completely randomly the skill levels of the players didn't mean shit
- When chess pieces were constructed in meaningful patterns, the advanced player could apply well developed schemas to recognize patterns and group pieces together

- The intermediate and novice players could not construct meaningful chunks as effectively

Storage: Retaining Information

Memory as a Network

Associative Networks

- A massive network of associated ideas and concepts
- Each node is connected to what you already know
- When you think about something like fire engine, there is a spreading activation of related concepts throughout the network
- **Priming** refers to the activation of one concept by another
  - Eg. Fire engine primes the node for red

Neural Networks

- Has nodes that are linked to on another
- In a **neural network** each concept is represented by a particular pattern or set of nodes that become activated simultaneously
  - Eg. When node 4 and 10 fire, you get one thought when nodes 4 and 15 fire you get another thought
- The neural network models are often called parallel distributed processing model

Types of Long-Term Memory

- Many scientists believe that we have different systems of long term memory

Declarative and Procedural Memory

- **Declarative memory** involves factual knowledge, and includes two subcategories
  - **Episodic memory** is our store of factual knowledge concerning personal experiences
  - **Semantic memory** represents general factual knowledge about the world and language
- **Procedural Memory** is reflected in skills and actions
  - Expressed by doing things such as typing, riding a bike, or playing a musical instrument
  - Classical conditioned responses are considered procedural

Explicit and Implicit Memory

- **Explicit memory** involves conscious or intentional memory retrieval
- Recognition requires to decide whether a stimulus is familiar
- Recall involves spontaneous memory retrieval
  - Cued recall is when hints are given to stimulate memory
    - Eg. If you can't remember hat, and one says it rhymes with hat, then bat is a cue
- **Implicit Memory** occurs when memory influences our behavior without conscious awareness
  - Eg. Edouard Claperede (anemic) was offered to shake hands with a scientist who held a pin in his hand
  - She has no recollection of the event but refuses to shake the experimenter's hand again

Retrieval: Accessing Information

- A **retrieval cue** is any stimulus, whether internal or external, that stimulates the activation of information stored in long term memory
  - Eg. Seeing a picture triggers memories of that person

The Value of Multiple and Self-Generated Cues

- A group of students were asked to read a list of 504 words and make 1 or 3 word associations for them
- They were asked to recall them later after seeing the association words that they made
    - Some were shown their won associations, others were shown the associations of other people
    - People who saw their own cues
        - Students who had 1 word recalled 61% of the words
        - Students who had 3 words recalled 91%
    - People who saw other peoples' cues
        - Students who had 1 word recalled 11%
        - Students who had 3 words recalled 55%
- This shows that having multiple self generated cues was the most effective method for maximizing recall

The Value of Distinctiveness

- If one word in a list does not fit in, it is distinctive, and you are more likely to recall that word
- It is helpful to associate information with things that are personally meaningful to oneself

Flashbulb Memory: Fogging Up the Picture

- **Flashbulb memories** are recollections that seem very vivid like snapshots of a moment in time
- We are easily recalled, but they are not necessarily accurate
    - Students were asked to write down what their memory of 911 was like and they were brought back 3 years later to write the experience again
        - 1/4 of them had completely different memories
    - Those who had stronger emotional response reported to have better memory
    - Among students who had terrible recall, 61% of them were highly confident of their memories

Context, State, and Mood Effects on Memory

- The **encoding specificity principle** states that memory is enhanced when conditions present during retrieval match those that were present during encoding
    - Eg. The jogger was in shock could not remember the rape, but after jogging through the same place, she remembered it vividly

Context-Dependent Memory: Returning to the Scene

- External cues lead us to **context-dependent memory**
- Its easier to remember something in the same environment in which it was acquired
    - Eg. Victims of crimes are taken back to the crime scene to better stimulate recollection of the event

State-Dependent Memory: Arousal, Drugs, and Mood

- Our ability to retrieve information is greater when our internal state at the time of retrieval matches our original state during learning
    - The jogger who was raped, rapidly remembered the rape while she was jogging through the same place again
        - Her state of jogging helped her remember the incident
- Eg. People who read while running the treadmill recalls the material better when running on the treadmill again, so it's not very good for tests, which are taken at rest
- If you are remembering something while being under the influence of drugs, recall is poorer when one is not using the drug
- **Mood-congruent recall:** We tend to recall information or events that are congruent

with our current mood
    - When we are happy we are more likely to remember positive events

Forgetting

The Course of Forgetting

- Hermann Ebbinghaus studied himself in a memory test
- He created over 2,000 nonsense syllables that he tried to memorize himself
- He used a method called relearning
    - If he learned a list of words that took him 20 trials, learning it a week later would only take him half as many trials
- He studied the intervals of forgetting and came up with the forgetting curve
    - One forgets a lot in the first interval, but it slows down as time goes on

Why Do We Forget?

Encoding Failure

- Sometimes we fail in encoding information from the short term memory into the long term memory
- There is too much stimuli and we do not commit to all of them deeply enough to remember them all
- Eg. People watched sexual, violent, and neutral shows, and 9 commercials were put into between
    - Those who watched the sexual or violent shows remembered the commercials less than those who watched the neutral shows because they were a lot more preoccupied with the content of their shows

Decay of the Memory Trace

- **Decay Theory:** with time and disuse, the physical memory traces in the nervous system fades away
    - This theory was disfavored because no one know what physical memory traces were
- Some neural circuits change as long term memories are formed
- Decay theory's prediction that the longer the interval of disuse between learning and recall, the less would be recalled
- Sometimes though, when a list of words were memorized, more was recalled during the second trial
    - This is called **reminiscence**, which is inconsistent with the concept that a memory trace decays over time

Interference, Retrieval Failure, and the Tip-of-the-Tongue

- According to the interference theory, we forget information because other items in the long term memory impairs our ability to retrieve it
- **Proactive interference** occurs when material learned in the past interferes with recall of newer material
    - Eg. If you change your phone number, your old number interferes your ability to memorize the new one
- **Retroactive Interference** occurs when newly acquired information interferes with the ability to recall information learned at an earlier time
    - Eg. If you finally remember your new number and was asked what your old number was, you may not remember it because your new number interferes with recalling the old number
- The more similar two sets of information are, the more likely that interference will occur
- Tip of the tongue (TOT) phenomenon is when we cannot recall a fact, but feeling that we are on the verge of recalling it

    - Occurs about once a week
    - Sometimes they are illusions, we think we know the correct answer when we really don't

Motivated Forgetting

- Motivational processes, such as **repression** may protect us by blocking the recall of anxiety arousing memories
    - Eg. Sometimes a thought is so shocking and anxiety arousing that one would feel the need to repress it

Amnesia

- **Retrograde amnesia** represents memory loss for events that occurred prior to the onset of amnesia
    - Eg. After getting hit in football, you have trouble remembering why you were in the hospital
- **Anterograde Amnesia** refers to memory loss for events that occur after the initial onset of amnesia
    - After H.M's operation, he cannot consciously form new long term memories
- **Infantile amnesia** is the loss of early experiences in childhood
    - This does not mean that infants do not form long term memories
        - They can remember their mother's voice and that certain behavior produce rewards
    - This is possibly caused by the fact that the mechanism for encoding long term memories are still immature in the first years after birth
    - Additionally, they do not have a personal frame of reference to organize their memories

Forgetting to Do Things: Prospective Memory

- **Prospective memory** concerns remembering to perform an activity in the future
    - Involves the prefrontal cortex
- Those with better retrospective memory does not necessarily have good prospective memories
- Studies support that we become increasingly absentminded about remembering to do things as get older
    - Older adults typically have poorer prospective memory

Memory as a Constructive Process

- Memories are usually incomplete and sketchy
- We construct a memory from bits of stored information in a way that makes sense to us

Memory Distortion and Schemas

- When a group of English men were told a native story and were asked to retell it 20 hours later, they reconstructed it in a way that makes sense to them
    - The word canoe was replaced with boat
    - The ghost that was helping the narrator is now the enemy
    - The narrator, instead of going seal hunting, is going fishing instead
- The story changed to fit the English culture
- People remember generalized ideas (schemas), but we use our preexisting schemas to fill in the gap
- Advertisers often take advantage of this effect
    - Advertisers may hint at something, but not claim it directly, so the viewer's previous schemas can fill in the gap

    - Listerine example
- Students consistently display boundary extension when drawing pictures from memory
    - They picture the scene as having a wider angle than it really was

The Misinformation Effect and Eyewitness Testimony

- The **misinformation effect** is the distortion of a event by misleading post-event information
    - This has relations to mistaken eyewitness testimony
- For example, when witnesses were asked to identify a criminal, they go for the one that looks like their image of a criminal
    - The actual criminal may appear gentlemanly and kind, and our schemas would deceive us in this scenario
- The eye witness account is affected by how the question is phrased
    - Eg. When asked how fast a car was going during the time of collision
        - Using the words smashed resulted in an estimated speed of 65.3km/h, while using the word contact resulted in an estimated speed of (50.9km/h)

Confusing the Source

- Misinformation often occur because of **source confusion**
    - Eg. If we see a mugshot of a stranger and then asked to pick out the criminal in a lineup, we are likely to pick the one in the mugshot that we saw
    - This is because we are not sure where we encountered the person, but they look familiar
- In a similar experiment, 29% of people identified an innocent suspect after being exposed to several misleading statements

Other Factors in Eyewitness Testimony

- Blood alcohol level of 0.10 results in less information being recalled and less accurate information 1 week after
- Identification based on voice seems to be less accurate than those based on both visual and auditory cues or visual cues alone

The "Recovered Memory" Controversy: Repression or Reconstruction?

- When a memory is forgotten, but spontaneously remembered again, is it accurate?
    - Is it caused by repression as Freud suggested or some other psychological process?
    - What caused the memory to be forgotten for so long?
- Freud's repression theory has been hard to demonstrate experimentally and other researchers propose that it could be just because of ordinary (non-motivated) sources of forgetting
- Retrograde amnesia can occur after a traumatic event
    - A child may not remember the violent deaths of his/her parents
- It has also been shown that people can mistaken suggested events as actual memories by the power of suggestion

The Biology of Memory

- Karl Lashley created lesions in the brains of animals, but could not find a location for where they are stored
    - Concluded that memory is stored throughout the brain
- McConnell classically conditioned a flatworm to a light that produced an electric shock so that when the light turned on the worm contracts
    - He then chopped it up into pieces and fed their RNA to untrained worms
    - The new worms began to show some conditioning to the light

    - However, this experiment failed to reproduce in other animals, and is now seen as a dead end

Where in the Brain Are Memories Formed?

- In human lesion studies, memory loss followed naturally occurring damage (from disease or accident)
- In non-human animal lesion experiments, researchers damage a specific part of the brain and observe how memory is affected
- Brain imaging studies examine the healthy brain as participants perform various memory tasks

The Hippocampus and Cerebral Cortex

- Brenda Milner came to the conclusion that the hippocampus and its adjacent tissue help to encode and retrieve long term declarative memories
- Most patients with hippocampal damage can retain short term memory but cannot form long term memories
- The hippocampus is not where long term memories are stored, just where they are encoded
    - They can recall information before their hippocampal damage
- The cerebral cortex plays a vital role in encoding by processing information from the sensory registers
- Different sensory registers are processed in different areas of the cortex, but are gradually bound together in the hippocampus
    - This hypothetical binding process is called **memory consolidation**
- The cerebral cortex stores semantic memories across wide ranging sites
- Components of epidosdic memory is stored across wide areas of the cortex
    - We retrieve and reintegrate these components to create a "unified memory"
- The prefrontal cortex plays a vital role in carrying out the functions of working memory
    - Deep (semantic) processing tasks causes activation in specific regions of the left prefrontal cortex and leads to better recall

The Thalamus and Amygdala

- Damage to the thalamus can produce severe amnesia
- N.A was stabbed through the nose by a fencing foil which damaged his thalamus
    - He suffered retrograde amnesia
- Damage to the thalamus can cause both retrograde and anterograde amnesia
- Amygdala encode emotionally arousing and disturbing aspects of events
- Amygdala damage prevent people from forming conditioned fear responses

The Cerebellum

- Has important role in forming procedural memories

Exceptional Memory

The Curse of Exceptional Memory

- Normal forgetting can dull unpleasant experiences of the past
- Students tend to recall higher grades rather than low ones
    - Errors made often made lower grades higher

Chapter 9: Thought, Language, and Intelligence

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- **Mental Representations** take a variety of forms, including images, ideas, concepts, and principles

Language

- Structure of the brain has been the same since 50,000 years ago, but it took 35,000 years for cave paintings to exist and another 12,000 to develop writing
- Language evolved as people gathered in larger social units
    - Allowed the formation of social systems, social customs, and communication of thought to others

The Nature and Structure of Language

- **Language** consists of a system of rules for combining symbols in a way that can produce an infinite number of possible messages and meanings
- **3 Properties of Language**
    1. Language is **symbolic:** uses sounds, written signs, or gestures to refer to objects, events, ideas, and feelings
        - Allows communicators to form and transfer mental representations to the mind of another person
        - **Displacement** refers to the fact that past, future, and imaginary events and objects that are not physically present can be symbolically represented and communicated through the medium of language
    2. Language and **structure:** there are rules to how symbols are combined into meaningful wholes
        - Eg. Pdpjdka is not a real English word
    3. Language is **generative:** symbols can be combined to generate an almost infinite number of messages that can have novel meaning

Surface and Deep Structure

- **Surface structure** consists of the way symbols are combined within a given language
    - **Syntax:** rules for combination (grammar)
- **Deep Structure:** underlying meaning of the combined symbols
    - **Semantics:** rules for connecting symbols to what they represent
- Eg: The following sentences have different surface structures and syntax, but the same deep structure.
    1. Eloise ran over the attacking pit bull with her Big Wheel
    2. The Big Wheel driven by Eloise ran over the attacking pit bull

Language from the Bottom Up

- Language has a hierarchical structure (**fig. 9.2**)
- **Phonemes:** lowest in hierarchy; small units of sounds that are recognized as separate in a given language
    - English has 40 to 50
- **Morphemes:** above phonemes; smallest unit of meaning in a language
    - One or more phonemes combine into a single morpheme (eg. Telephone)

Acquiring a Language

Biological Foundations

- Humans are born linguists
- Human children, despite their limited thinking skills, begin to master language early

in life without any formal instruction
- Different languages have developed independently in different parts of the world seem to have a common underlying deep structure
- Infants are born with the ability to vocalize the entire range of phonemes
- At 6 months of age, infants begin to lose the ability to differentiate sounds that are not in their language
    - Eg. Japanese children lose the ability to distinguish between r and l
- Linguists claim that there is a **sensitive period** during which language is most easily learned
    - Usually extends from infancy to puberty
    - Eg. Children who grew up alone or were had parents who neglected them were able to acquire language skills if they were younger; children who are past puberty and does not have a language tend to have more trouble learning a language
- Sign language follows the same patterns as vocalized language and is acquired in the same manner

Sex Differences

- **Broca's area** is responsible for **speech production**
- **Wernicke's area** is responsible for **speech comprehension**
- Damage in either area can cause **aphasia**, a disruption in speech comprehension and/or production
- Men who suffer left hemisphere strokes are more likely to show severe aphasic symptoms than women
    - Suggests that more of women's language is localized in the right hemisphere
    - fMRI studies by Susan Rossell supports this hypothesis

Social Learning Process

- Social learning plays a central role in language acquisition
- **Motherese:** a high pitched voice that mothers tend to use with their children
- B. F. Skinner claims that language comes from operant conditioning where parents reinforce correct verbalization
    - Proven to be untrue
        - Children learn too much too fast for operant conditioning
        - Most parents do not correct their children's grammar and language skills
            - Parents are more interested in the deep structure and not the surface structure
- By 2 years of age, children utter two word sentences called **telegraphic speech** that consist of a noun and a verb

Bilingualism: Learning a Second Language

- Much of the vocabulary of a language can be learned at any age, but mastery of the syntax depends on early acquisition
- One concern is that children will mix and match the two languages
    - Children begin to differentiate their two languages by two years of age and code mixing is not a lasting source of confusion
- Bilingual students show superior cognitive processing when compared to monolinguists
- Greater flexibility in thinking and better performance in standardized tests correlate positively with bilingualism
- Bilinguists who are proficient in the second language and acquired it during an early age showed processing in the same cortical area as the first language
- Those who acquire a second language later on in life with speaks with less proficiency

uses a different area than that of the native language

Linguistic Influences on Thinking

- Benjamin Lee Whorf: **Linguistic relativity hypothesis;** language determines what we are capable of thinking
    - Eg. Since Hopi Indians lack a past tense, they would have difficulty remembering past events
- Eleanor Rosch proved this false
    - Showed a group of people who only differentiated two colors
    - They could differentiate many hues just like people speaking any other language
- Linguists today thinks that language do no determine how we think but can influence how we think and how efficiently we can categorize our experiences
- Language can help enforce stereotypes
    - Eg. Using "he" to refer to mankind in general makes the sentence male biased
- English speaking students consistently score lower in mathematical skills such as counting
    - Could be because in Chinese, the language is constructed around the base 10 system
    - In English, numbers such as twelve and eleven does not correlate well with the base 10 system
- **Propositional thought** expresses a statement and takes the form of a verbal sentence that we seem to "hear" in our minds
- **Imaginal thought** consists of images that we can see, hear, or feel in our minds
- **Motoric thought** consists of mental representations of motor movements such as throwing an object

Concepts and Propositions

- Much of our thinking takes the propositional form
    - Eg. "University students are intelligent people"
- Propositions consists of concepts combined in a particular way
    - 2 types: **Subject** and **predicate**
- **Concepts** are the basic units of semantic memory
- Many concepts are hard to be defined explicitly but can be defined by **prototypes**
    - Eg. Vegetables
- Using prototypes only requires one to judge the similarities
    - Eg. It would take longer to judge whether a penguin is a bird than if asked whether a sparrow is a bird. This is because sparrows fit better with our conception of a bird while penguins are less so.
- Prototypes differ from person to person so there is a degree of arbitrariness and individual difference in prototypic concepts
    - Eg. Definition of a political radical
- Do how a proposition is stated affect how we solve problems?
    - Eg. If a cancer treatment is said to be "50% successful" as opposed to "50% failure", would it make a difference on a person's decision?
    - People who were told a treatment is 50% successful will more likely administer the treatment to a family member
    - 50% failure makes the treatment seem more risky

Reasoning and Problem Solving

- Scientists believe that our capacity for logical thinking has been honed by

evolutionary forces because of its adaptive value
- Most primitive form of problem solving is trial and error
    - Reasoning and logic can avert the time consuming and hazardous process of trial and error

Reasoning

- **Deductive reasoning** is reasoning from the "top down"
    - People start with general principles assumed to be true and uses that to determine what they imply about a certain situation
    - This is considered a more valid form of reasoning because if the premises are true, so must be the conclusion
        1. If all humans are mortals and (premise 1)
        2. Socrates is a human (premise 2)
        3. Then Socrates must be a mortal (conclusion)
- **Inductive reasoning** is in the bottom up fashion starting with specific facts and trying to develop a general principle
    - Eg. Pavlov observed that all dogs salivate when he ringed the bell; he formulated that to be classical conditioning
    - Can lead to likelihood rather than certainty
- In science both approaches are used to prove a theory in a process called **hypothetico-deductive approach**
    - Eg. One observes that when many bystanders are present, they often fail to offer help. Scientists formulate a theory that the more bystanders there are, the less likely they are willing to help. This is a form of inductive reasoning. Then, the theory is tested via deductive reasoning via an experiment to test its validity.

Stumbling Blocks in Reasoning

- There are many factors that prevent us from selecting the information needed to draw sound conclusions

Distraction by irrelevant information

- Eg. A drawer contains 19 black socks and 13 blue socks, how many do you have to pull to get a complete set?
    - The 19 black socks and 13 blue socks are irrelevant. You only need to pull 3 to ensure you have a complete set.

Failure to apply deductive principles

- We fail to use the knowledge we know to apply to new problems
- Eg. Solving Y=mX + b problems
    - When physics students were asked to solve this type of problem in novel mathematical representations, they were less successful because they've only learned to use it in physics problems.

Belief Bias

- Tendency to abandon logical rules in favor of our own personal beliefs
- Factual fallacy does not equate logical fallacy
    1. All things that are smoked are good for one's health
    2. Cigarettes are smoked
    3. Therefore cigarettes are good for one's health
- The premise is false, but the logic is perfectly valid

Problem Solving

- Comes in 4 stages

Understanding, or Framing, the problem

- How we mentally, represent, or frame, a problem can make a huge difference in how we solve the problem
    - Eg. Train-crow anecdote, pg. 369

Generating Potential Solutions

1. Determine which procedures and explanations will be considered
2. Determine which of these solutions are consistent with the evidence that has so far been observed. Rule out any solutions that do not fit the evidence.

Testing the Solutions

- Consider the remaining solutions and design a test to determine whether it leads to a solution
- Eg. Water jug problems pg. 369/370
- People tend to develop a **mental set,** a tendency to stick to solutions that have worked in the past; this can lead to less effective problem solving

Evaluating the Results

- "Is there an easier or more effective way to accomplish the same objective?"

Problem Solving Schemas

- **Problem solving schemas** are like mental blue prints, or step by step scripts for selecting information and solving specialized classes of problems
    - Eg. Social interaction, cooking, etc.
    - We know what to do without having to engage in formal problem solving procedures
- Chessmaster Gary Kasparov can regularly defeat computers because of his complex mental schemas
- Experts have great many schemas to guide them in problem solving in their field
- Neurons and brain function changes as one becomes an expert at something

Algorithms and Heuristics

- Algorithms are formulas or procedures that automatically generate correct solutions
- Eg. If you want to find all the combination of letters in an anagram, there would be 40,320 possibilities
- **Heuristics** are general problem solving strategies that we apply to certain classes of situations
    - Mental shortcuts that may or may not provide correct solutions
    - Eg. Using general word construction principles to recombine anagrams
- **Means-Ends analysis** is an example of heuristics where one identifies differences between the present situation and one's desired state and make changes to reduce these differences
    - Eg. Goal is to write a 30 page paper at the end of the term. Presently 0 pages are written. How to reduce this difference?
- **Subgoal analysis** is when you break large problems into subunits/intermediate steps
    - Eg. Writing a paper
        - Break is down into several areas such as choosing a topic, doing research, making a general outline, writing a first draft, and editing

Uncertainty, Heuristics, and Decision Making

- Typically decisions are made that has a high probability of a positive outcome
- We apply certain heuristics to form judgments of likelihood

The Representativeness Heuristic

- Used to infer how closely something or someone fits our prototype for a particular concept and therefore how closely they are a member of that class

Availability Heuristics

- Causes us to base judgments and decisions on the availability of information in

memory
- If something is at the forefront of our memories, it is readily applied, but we may exaggerate the likelihood that it could occur
    - Eg. 9/11 made people scared to fly and made businesses afraid to rent landmark office spaces

Confirmation Bias
- The tendency to look for evidence that could confirm their beliefs rather than looking for evidence that could disconfirm them
- Eg. Card problem pg. 9.18
- People tend to recall feedback from others that confirms their beliefs about themselves

Intelligence
- **Intelligence** is a 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
- Francis Galton's work grew out of a purely scientific desire to extend Darwin's theory of evolution to the inheritance of mental abilities
- Alfred Binet's concern was the practical one of finding a means to identify "mentally defective" children who would be unable to profit from normal educational experiences

Galton: Quantifying Mental Ability
- Galton showed through family trees that eminence and genius seemed to occur across generations within certain families
- He tried to demonstrate a biological basis for eminence by showing that people who were more socially and occupationally successful would also perform better on a variety thought measurements
- His worked was generally incorrect

Alfred Binet's Mental Tests
- Commissioned by French's Ministry of Education to develop the a intelligence test
    - Some children couldn't benefit from normal education and educators wanted to identify these children as early as possible so that special education could be arranged for them
- Made 2 assumptions about intelligence
    - Intelligence increases with age
    - The rate a which people gain mental competence is a characteristic of the person is fairly constant over time
- Asked teachers about what children should be able to do a different ages
    - Children were tested for their **mental age**
        - Eg. 8 year old with a 10 year old's problem solving skills has the mental age of 10
- German psychologist William Stern created a relative score for intelligence called **Stern's Intelligence Coefficient (IQ)**
- IQ = (mental age/chronological age) x 100
- There are problems with IQ tests
    - Increase in mental age slows down dramatically at about age 16
    - A 40 year old cannot be expected to have twice the level of mental skill of a 20 year old
    - In advanced ages, a decline starts to occur
    - James Flynn has discovered that there is a rising curve in intelligence and people are progressively getting smarter

- Today's IQ is known as **Deviation IQ** and represents how much standardized distance a score is above or below the mean for that particular sample

The Stanford-Binet and Wechsler Scales

- Lewis Terman translated Binet's tests into English and added items that were relevant to American culture
    - Became known as the **Stanford-Binet** test
- A major competitor came in the form of **the Wechsler Scales**
    - Believed that intelligence should be measured as a distinct set of verbal and nonverbal skills
- Wechsler scales fall into two classes: Verbal Tests and Performance Tests

Group Tests of Aptitude and Achievement

- Group tests of intelligence can be used to obtain IQ scores from groups of people at the same time
    - Eg. Lorge-Thorndike Intelligence Test and the Otis Lennon School Ability Test
- Other tests are measurements of specific mental skills
    - Scholastic Aptitude Test (SAT)
    - Graduate Record Examination
- Should tests be measured for how a much a person already knows or his/her potential for learning?
    - **Achievement test** vs **Aptitude Test**
    - Argument is that achievement test is a good predictor of future performance in a similar situation
    - Counter argument is that not everyone has a had a an equal opportunity to learn
    - However, it is difficult to construct a test that is independent of previous learning
- Most intelligence tests today measure both achievement and aptitude

Scientific Standards for Psychological Tests

- A **psychological test** is a method for measuring individual differences related to some psychological concept, or construct, based on a sample of relevant behavior
- To construct a test, one needs to decide which specific behaviors serve best as indicators of intellectual abilities
    - You need to take a sample

Reliability

- Refers to consistency of measurement
- Assume that intelligence is a stable trait, and that **test-retest reliability** in the same group of people should be similar on different occasions
- Correlation of IQs 9 year olds and 40 year olds is in the .7 to .8 range showing a high degree of stability
    - **Relative to age**, a person's intelligence does not change very much
- The test itself must **be internally consistent,** meaning that all the items within a test is measuring the same thing
- **Interjudge reliability** is when the same score should be given even if different psychologists grade the same test
    - Scoring instructions must be explicit

Validity

- **Validity** refers to how well a test actually measures what it is designed to measure
- **Construct validity** refers to whether a test is actually measuring what its trying to measure
    - A test with perfect construct validity means that IQ differences truly measures

differences in intelligence
- **Content validity**: does the test include all the aspects for the construct of interest
    - Eg. An arithmetic test should include all the modes of operation and not just addition
- **Predictive validity** is how highly scores correlate with criterion measures such as school and job performance
    - IQ and school performance grades are in the +.60 range for high school students and +.30 to +.50 for university students
    - SATs predict university performance with correlation of just below +.50
    - To a lesser degree, IQ predicts job performance with a +0.2 to +0.5 correlation

Standardization and Norms

- **Standardization** has 2 elements
    1. Tests must be administered in a well controlled environment to eliminate uncontrolled factors
    2. A collection of **norms** (Test scores derived from a large sample) used to compare and interpret individual scores
- When norms are collected for mental skills, it forms a bell shaped curve known as a **normal distribution**
    - The very center in an IQ test is given the score of 100

The Nature of Intelligence

- **Psychometrics** is the statistical study of psychological tests
    - Attempts to identify and measure the abilities that underlie individual differences in performance and intelligence tests
    - Uses **factor analysis**
        - Analyzes patterns of correlations between test scores in order to discover clusters of measures that correlate highly with one another but not with measures in other clusters
            - Eg. If 4 different tests all use mathematical test methods, then we can say that the underlying factor is "mathematical reasoning ability"
    - Psychometric theorists disagree about what intelligence is
        - Some say that it is a single global mental ability that cut across all that we would call thinking
        - Others would say that it is a set of specific abilities to do different types of thinking
- **The g factor: intelligence as a general mental capacity**
    - Spearman observed that math grades and language grades, arithmetic reasoning and vocabulary abilities are almost always positively correlated
    - Concluded that **intellectual performance is determined partly by "general intelligence" (g)** and partly by special abilities required to perform that particular task
- **Intelligence as specific mental abilities**
    - Thurstone claimed that correlation in different mental tasks are far from perfect
    - Claimed that human mental performance depends on seven distinct abilities (pg. 385) known as **primary mental abilities**
        - Claimed that performance in mental tasks is more influenced by specific abilities relevant to that task than any underlying g factor
- **Crystallized and fluid intelligence**
    - Current knowledge about the nature of mental abilities suggest a intermediate between Spearman and Thurstone's position as proposed by Raymond Cattell and John Horn

    - Breaks down Spearman's general intelligence into crystallized intelligence and fluid intelligence
    - **Crystallized intelligence:** ability to apply previously acquired knowledge to current problems; depends on retrieval abilities of long term memory
    - **Fluid intelligence:** ability to deal with novel problem solving situations for which personal experiences does not provide a solution (eg. Tower of Hanoi)
        - Depends on the ability to reason abstractly, think logically, and manage information in working memory
    - Crystallized intelligence generally improves with age and fluid intelligence decreases in late adulthood
- **Multiple intelligences: beyond mental competencies**
    - Some psychologists claim that intelligences may be conceived more broadly as independent intelligences tha relate to different adaptive demands
    - Defines 6 different intelligences
        1. Linguistic
        2. Mathematical
        3. Visual spatial
        4. Musical (ability to perceive pitch and rhythm)
        5. Body kinesthetic (ability to control body movements and skilfully manipulate objects)
        6. Personal (understanding ourselves and others)
    - First 3 are measured by intelligence tests
    - Studies brain damaged people, who are disabled in the general sense but exhibit striking skills in specific areas such as the ability to memorize television commercials word for word
- **Emotional Intelligence**
    - **Emotional intelligence** involves 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
    - They tend to form stronger emotional bonds with others, enjoy greater success in careers, marriage, and childbearing
        - Seems to have a higher quality of life than those with higher mental intelligence

Cognitive Process Approaches: Processes Underlying Intelligent Thinking

- **Cogitive process theories** try to explain why people vary in intelligence by relating the types of individual variation described in the psychometric approach to the cognitive skills

Sternberg's triarchic theory

- His **triarchic theory of intelligence** addresses both the psychological processes involved in intelligent behavior and the diverse forms that intelligence can take
- Divides cognitive processes that contribute to intelligent behavior into three specific classes: metacomponents, performance components, and knowledge acquisition components
- **Metacomponents** are the higher order processes used to plan and regulate task performance
    - Include problem solving skills such as identifying problems, formulating hypotheses and strategies, testing them logically, and evaluating performance feedback
        - Intelligent people spend more time framing problems and developing strategies than less intelligent people

- **Performance Components** are the actual mental processes used to perform the task
    - Retrieving appropriate memories, making responses
- **Knowledge acquisition components** allow us to learn from experience by storing information in memory and combining new insight with previously acquired information
- Environmental demands call for three different manifestations of intelligence
    1. **Analytical intelligence** involves the kinds of academically oriented problem solving skills assessed by traditional intelligence tests
    2. **Practical intelligence** refers to the skills needed to cope with everyday demands and to manage oneself and other people more effectively
    3. **Creative intelligence** is the mental skills needed to deal adaptively with novel problems
- These different intelligences are distinct from one another
- Believes that educational programs should teach all three classes of skills

Galton Resurrected: intelligence and Neural Efficiency

- Electrophysiological studies of the brain responses to visual and auditory stimuli which may reflect the speed and efficiency of information processing in the brain
- PET scans of people's brains show that lower levels of glucose consumption in people of higher intelligence, suggesting that the brain works more efficiently and expends less energy

Influences on Intelligence

Cultural and Group Differences in Intelligence

- People in different cultures have different conceptions of intelligence based on the adaptive demands that confront a culture and the behaviors that required to cope with those demands

Ethnic Group Differences

- Rushton of UWO reported in a test that East Asians had the highest intelligence scores while Africans had the lowest
    - He was criticized for violating the Onatrio Human Rights code
- Results of intellectual differences between races are mixed, some show that East Asians score higher while others claim that they are the same
- In the US, Asian Americans score higher than Caucasians in standardized tests and blacks test 12 to 15% IQ points lower than Caucasians
- There are concerns about that these test underestimate the mental competence of minority group members because the tests are culturally based
- People attribute the seemingly racial differences to environmental factors
    - Eg. Black people were marginalized and because of that, they did not have optimized educational environments
- Another factor is that there seems to be more differences in within any racial group than between racial groups

Sex Differences in Cognitive Abilities

- Men are better at visual spatial tasks and are more accurate in target directed skills such as throwing and catching objects
    - Tend to outperform women in mathematical reasoning
- Women perform better in fine motor coordination
- Attributed to both environmental and biological basis
    - Environmental: men and women are exposed to different socialization as they grow up
        - Eg. More men play sports that involve throwing or catching objects

- Biological explanations focuses on the effects of hormones on brain development
    - Sex hormones creates differentiation and alter brain organization

Extremes of Intelligence

The Cognitively Disabled

- 3 to 5% of North Americans are mentally retarded
    - 4 level classification system based on IQ scores
- Most people are mildly retarded an are capable of holding a job, marrying, etc
- 25% of known cases of retardation have biological causes
- Can also be caused by accidents at birth
- In North America, a policy of inclusion has taken place where retards are included in regular classrooms but are given special help

The Intellectually Gifted

- Gifted individuals have IQ above 120
- Children will often exhibit giftedness in one area but average in others
- Tend to read and walk at an earlier age, good abstract reasoning, read obsessively, but have poor handwriting
- They require special attention and special education to make sure they are not bored
- They are subject to social stereotypes such as being socially maladjusted and eccentric
    - However, a study done by Lewis Terman show that they are typically happy adults with normal social lives

Chapter 10: Motivation and Emotion

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- **Motivation** is a process that influences the direction, persistence, and vigor of goal directed bhavior

Perspectives on Motivation

Instinct Theory and Evolutionary Psychology

- **Instinct** is an inherited predisposition to behave in a specific and predictable way when exposed to a particular stimuli
    - Not learned, having to do with survival
    - Circular thinking - why people greedy? Because of instinct. How do we know greed is an instinct? Because people are greedy.
- Evolutionary theory claims that people have motives because they are of adaptive significance
    - Eg. People are social creatures because it allowed them to share resources, mutually protect each other, and resulted in more successful offspring development

Homeostasis and Drive Theory

- **Homeostasis** is a state of internal physiological equilibrium that your body tries to maintain
    - Perspire when we are warm, shiver when we are cold to maintain a certain internal temperature
- Clark Hull's **drive theory** states that physiological disruptions to homeostasis produce drives which is internal tension that motivate an organism to behave in ways that reduce the tension
    - Eg. Lack of water leads to thirst, which drives the organism to obtain some water
    - However, does not explain why people go on diets (which increases food drive) and go to tension causing horror movies

Incentive and Expectancy Theories

- **Incentives** are environmental stimuli that pull an organism toward a goal
    - If something has a high enough incentive value, it can *pull* the organism into action
    - Eg. Heroin users use heroin because it makes them feel good, not because of a biologically based drive
- Different people respond differently to the same incentives
    - A cognitive explanation is called **expectancy x value theory**, which claims that motivation comes from a combination of expectancy and the value placed on the goal
        - Eg. James is motivated to practice calculus because he believes that the more you study the more of a chance you will get an A, and he places a hh value on that A.
- **Extrinsic motivation** is performing an activity to obtain an external reward or to avoid punishment
- **Intrinsic motivation** is performing an activity for enjoyment
- Research shows that tangible rewards (money, prize) for doing an activity reduces intrinsic motivation, but nontangible extrinsic rewards (praise) increases intrinsic motivation

Psychodynamic and Humanistic Theories

- Takes a view in context of personality development and functioning
- Our drive comes from unconscious motives, particularly those sexual and aggressive in nature
    - Expressed through socially acceptable behaviors
- Maslow believe that humans has a need for personal growth
    - Distinguishes between **deficiency needs** which is required for physical and social survival and **growth needs** which are uniquely human and motivate us to develop our potential
- Maslow proposed a **need hierarchy** (fig. 10.2) with deficiency needs at the bottom and growth needs at the top
- Critics point out that prisoners of war rather endure torture and pain than rat out their comrades

Hunger and Weight Regulation

- Biology offers a push to eat, but the delicious taste offers a pull

Physiology of Hunger

- **Metabolism** is the body's rate of energy (or caloric) utilization
    - 2/3 of energy intake is used to support **basal metabolism,** the body's resting continuous metabolic work of body's cells
- There are short term signals that start meals by producing hunger and stop food intake by producing satiety (no longer hungry)
- Body monitors "long term" signals based on body fat content
    - Adjust appetite and metabolism to compensate for times of overeating or undereating
- Researchers believe that there is a set point around which body mass is regulated
    - If we eat too much or too little, metabolism will kick in and return you to your original weight
    - Contrary research has shown that homeostatic mechanism makes it harder to keep gaining or losing weight but not necessarily return us to our original weight

Signals That Start and Terminate a Meal

- A.L. Washburn swallowed a balloon and every time he felt hungry, he would press a button
    - His hungry cycle corresponded with his stomach contractions
    - However, hunger pangs did not cause the feeling of hunger
        - People with nerves from their stomach cut or have their stomachs removed continued to feel hunger
- When you eat, enzymes break food down to various nutrients
- One key nutrient is **glucose** which is a major source of immediately usable fuel especially for the brain
- Sensors in the hypothalamus and liver monitor blood glucose levels
    - When levels drop, the liver responds by converting stored nutrients back into glucose
- Campfield showed that there is a drop and rise in glucose (10%) prior to feeling hunger
- Several body signals combine to end out eating
    - **Stomach and intestinal distention** are "satiety signals"
        - Does not mean that the stomach actually has to be filled
            - Nutritionally rich food tends to make us feel full faster
- Intestines respond to food by releasing several hormones called peptides that help

terminate a meal
    - **CCK (Cholecystokinin)** is released into your bloodstream by the small intestine as food arrives from the stomach

Signals That Regulate General Appetite and Weight

- Fat cells actively regulate food intake and weight by secreting **leptin**, a hormone that decreases appetite and increases energy expenditure
    - It's a background signal, it causes other satiety factors to make us feel full faster
- Leptin research came from mice
    - Mice with an ob gene does not create leptin; the mice over eat and become obese
    - Mice with a db gene produces leptin, but their brains are insensitive to leptin and they become obese
        - Cannot be helped with leptin injections
- Most obese people have ample leptin in their blood, but their brains seem to be insensitive to that information

Brain Mechanisms

- Two regions in the hypothalamus seem to be controlling the intake of food
- The **lateral thalamus** (LH) seems to be a "hunger on" center
    - Electrical stimulation causes them to start eating and lesioning causes them to stop eating
- The **ventromedial hypothalamus** (VMH) is a "hunger off" center
    - Stimulation causes rats to stop eating and lesioning causes them to be gluttonous
- However, research shows that many neurons from many areas of the brain congregate in the LH and VMH, and cutting the neurons along the tract causes some duplicate effects of LH and VMH lesions
- Many pathways involve the **paraventricular nucleus** which is a cluster of neurons that stimulate or reduce appetite
    - Integrates several different short term and long term signals that influence metabolic and digestive processes
- When people eat less to try and lose weight, it causes the decrease in leptin levels, which causes an increase in **neuropeptide Y**, which increases appetite drastically

Psychological Aspects of Hunger

- Behaviorally, eating is positively reinforced by the good taste of food and negatively reinforced by hunger reduction
- Cognitively, we develop an expectation that eating will give us pleasure
- Our memory of our last meal also affect how much we eat
    - Amnesia patients will accept multiple meals one after the other because they've forgotten their last meal
- Beliefs such as "don't' leave food on your plate" and habits such as snacking while watching TV can affect how much we eat
- For women, food restrictions come from the cultural standard of beauty
- People who perceive themselves as heavy tend to have a lower self esteem, but this relation is more pronounced among women than men
- Fredrickson and Roberts's **objectification theory** claims that Western cultures teach women to view their body as objects as an external observer would
    - This increases body shame and anxiety, which leads to eating restrictions and disorders

Environmental and Cultural Factors

- People are sensitive to environmental stimuli such as portion size, the number people

present during a meal, and the amount that others eat
- For people in poverty, food scarcity causes limited consumption
- Food taste and variety regulates eating
    - Good food = more eating
    - More food variety = won't grow tired of eating = eat more
- Classical conditioning causes us to associate smell and sight of food with its taste and can trigger hunger
- We typically eat more dining with other people than alone
    - Meals tend to take longer
- Although we enjoy diversity, we generally feel more comfortable selecting from more familiar foods

Obesity

- Between 25 to 29.9 BMI is considered overweight and a BMI over 30 is considered obese
- Often blamed on a lack of willpower, weak character, or emotional disturbances, but research does not consistently find such psychological differences between obese and non-obese people

Genes and the Environment

- Heredity contribute to our weight
    - Different basal metabolic rate and tendency to store energy as either fat or lean tissue
    - Causes about 40 to 70% variation in body mass among men and women
- Over 200 genes have been identified as possible contributors to human obesity
- The environment also plays a part in obesity caused by:
    - An abundance of inexpensive, tasty, high fat foods available almost everywhere
    - Cultural emphasis on getting the best value which contributes to the supersizing of menu items
    - Technological advances that decreases the need for daily physical activity and encourage a sedentary lifestyle
- The Pima Indians of Arizona are genetically predisposed to obesity and diabetes, but their lifestyle prevented their genetics from showing
    - However, after adopting the American way of life, they now have the highest obesity and diabetes rates in the world

Dieting and Weight Loss

- Being fat primes people to stay fat
- Fatter people have higher insulin levels which increases the conversion of glucose into fat
- Weight gains makes it hard to exercise vigorously
- Dieting slows down energy expenditure
- Strunkard's research showed 95% of people who go on weight loss programs lose it within a few years

Sexual Motivation

- Sex is a biological "reproductive drive"
- People usually have sex for pleasure
- In adolescents, both genders cited peer pressure more than sexual gratification
- Many women find their first sexual intercourse disappointing
- Wright found that most women viewed sex as an unenjoyable marital duty

Sexual Behavior: Patterns and Changes

- A representative sample of 18 to 59 year old Americans have sex with their partners at least a few times a month
- Single adults who cohabit are the most sexually active
- Single adults who do not cohabit are the least active
- Men fantasize about sex more than women do
- 25% of men and 10% of women masturbate one or more times per week
- Men tend to be earlier exposed to sexual intercource
- Premarital sex is on the increase
    - Changing social norms, trend toward sexual activity at a younger age, and a tendency to delay marriage have contributed to an increase in premarital sex
    - May be leveling off shortly due to a cultural emphasis on the depth of relationships and the increase in STIs

The Physiology of Sex

- Masters and Johnson began a study of 694 men and women under laboratory conditions
    - Monitored 10,000 episodes in which volunteers masturbated, had intercourse, and other sexual activities

The Sexual Response Cycle

- Most people go through a 4 stage **sexual response cycle** when sexually aroused

1. During **excitement phase**, arousal builds rapidly
    - Blood flow increases to arteries in and around the genital organs, nipples, and women's breasts
    - Penis and clitoris become erect and vagina becomes lubricated
2. During the **plateau phase** respiration, heart rate, vasocongestion, and muscle tension continue to build until there is enough muscle tension to grigger orgasm
3. During the **orgasm phase**
    a. in males, rhythmic contraction of internal organs and muscle tissues surrounding the urethra project semen our of the penis
    b. In females, orgasm involves rhythmic contractions of the outer third of the vagina
4. **Resolution phase**
    a. Physiological arousal decreases rapidly and genitals return to their normal conditions
    b. Males enter a **refractory period** which they are temporarily incapable of another orgasm

Hormonal Influences

- Hypothalamus plays a key role in sexual motivation
    - Controls the pituitary gland which secretes **gonadotropins** into the blood stream
    - This affects the rate at which the **gonads** secrete **androgens** (such as testosterone) and **estrogens** (such as estradiol)
- Sex hormones have **organizational effects** that direct the development of male and female characteristics
    - In males, the embryo forms testes about 8 weeks after conception
    - Years later, the hypothalamus increases the release of sex hormones as the male reaches puberty
    - In females, the lack of androgens causes the development of female sex parts
- Sex hormones have **activational effects** that stimulate sexual desire and behavior
- Mature males have relatively constant sex hormone secretion and their desire to have sex is largely governed by the presence of environmental stimuli

- In females, they follow an "estrus" cycle and are only sexually receptive during periods of high estrogen secretion
- Hormonal surge of puberty results in increased sexual motivation
- In men and women, androgens appear to have the primary influence on sexual desire

The Psychology of Sex

Sexual Fantasy

- Among 18 to 59 year olds, 50% men fantasize about sex once a day, 1/5 of women
- Fantasy alone can trigger genital erection and orgasm in some people
- Men and women fantasize at least occasionally during sexual intercourse
    - People who are more sexually active tend to fantasize more

Desire, Arousal, and Sexual Dysfunction

- Psychological factors can cause inhibition in sex
- Many people have trouble becoming or staying aroused due to stress, fatigue, and anger
- **Sexual dysfunction** refers to chronic, impaired sexual functioning that diestresses a person
    - 10% of men report difficulty maintaining erection and 20% of women have trouble becoming lubricated and aroused

Cultural and Environmental Influences

Cultural Norms

- Childhood sexuality is suppressed in our culture but is permitted and encouraged in others
    - Marquesan people let their babies watch them have sex and help a distressed child by masturbating them
    - When they reach adolescence, the adults instruct them in sexual techniques and has intercourse with them

Arousing Environmental Stimuli

- The environment affects sexuality through sexually arousing stimuli
    - Eg. A lover's caress, watching a partner undress
- Men and women experience sexual arousal to descriptions of explicit sex, but not to description devoid of sexual content
    - Both genders showed the strongest arousal when erotic stories focused on the female character

Pornography, Sexual Violence, and Sexual Attitudes

- Most pornography consumers are men, although 1/3 of people who have purchased or rented X-rate video tapes are women
- 20% of 15 to 44 year old North American women report that they have experienced forced sexual intercourse at least once in their lives
- Most rapes are not committed by strangers
- The **social learning theory** shows that people learn through observation
    - Porn that depicts rapes; shows that sex is impersonal; men can hae sex when they want it; women like being dominated and coerced into sex;
    - Men who watch porn will learn through watching it
- The **catharsis principle** claims that people have naturally aggressive and sexual impulses and that watching depictions of aggressive content will return us to our normal state and decrease sexually aggressive behavior
- Correlational studies do not have clear support for either viewpoint
- In a study, university students were divided into 4 groups

    - Group 1: non-sexual talk show
    - Group 2: consensual sex
    - Group 3: rape myth where first there was resistance, but woman starts to like it after
    - Group 4: rape
- In a later unrelated experiment, people who were in group 3 and group 4 showed increased aggression towards a female confederate but not a male confederate
- Pornography's impersonal depiction of sex contributes to the occurrence of rape

Sexual Orientation

- Refers to one's emotional and erotic preference for partners of a particular sex

Prevalence of Different Sexual Orientations

- Sexual orientation has 3 dimensions: self identity, sexual attraction, and actual sexual behavior
- 3% of North American men and 1% of women identify themselves as homosexuals or bisexuals

Determinants of Sexual Orientation

- One psychodynamic theory proposed that male homosexuality develops when boys grow up with a weak, ineffectual father and identify the mother as the dominant one
- Behaviorist suggest that homosexuality is a conditioned response developed by associating adolescent sexual urges with the presence of same sex partners
- Alan Bell concluded that there is no particular phenomenon that results in homosexual or heterosexual development
- In childhood, homosexuals feel different from members of their own sex and are more likely to engage in gender non conforming behaviors
- Homosexual girls in Brazil, Peru, Phillipines, and United States were twice as likely to be identified as tomboys
- In gay men, there is 52% concordance among identical twins, 22% for fraternal, and 11% for adoptive
    - 48, 16, and 6 for girls
- Prenatal exposure to sex hormones can influence sexual orientation
    - Some males are insensitive to their own androgens and some females have an atypical build up of androgens
- Environmentally, it is possible that biology only determines basic personality types, but different personality styles steer children toward different socialization experiences which determines sexual orientation

Achievement Motivation

Motivation for Success: The Thrill of Victory

- People strive for success for two different reasons
    1. **Motive for Success**
        - Attracted to the thrill of victory in mastering skills or outperforming other people
        - University students with a high motivation for success focus on mastery goals and performance approach goals
        - **Master goals:** intrinsic motivation such as wanting to learn as much as possible
        - **Performing approach:** strive to outperform classmates
    2. **Fear of Failure**
        - Have performance approach goals and also **performance-avoidance** goals

(fear of performing poorly)
    - The combination of fear of failure and performance-avoidance goals impair task performance because it causes anxiety which makes information processing less effective

Achievement Needs and Situational Factors

- People with strong need for achievement (especially those with high motivation for success and low on fear of failure) are ambitious and persist longer after encountering difficulty than most other people
- Those with high achievement motivation (**need achievement**) tend to enter more prestigious occupations
- Competitive situations decrease low need achievers' task enjoyment, but are beneficial to high need achievers
- High need achievers are most likely to strive hard for success when:
    - They perceive themselves as personally responsible for the outcome
    - They perceive some risk of not succeeding
    - There is an opportunity to receive performance feedback
- In terms of risk management, need achievers tend to choose the intermediate difficulty task while fear of failure people tend to choose the easy task or the most difficult task (where success if unexpected)
- Perception of task difficulty counts because people have different abilities for various activities

Family and Cultural Influences

- High need for achievement develops when parents encourage and reward achievement but do not punish failure
- Fear of failure is seems to develop when successful achievement is taken for granted by parents but failure is punished
- North American and European cultures stress personal achievement
- China and Japan nurture collectivism, and care about their parents' expectations of academic success than do American students

Motivation in the Workplace

Why do People Work?

- Taylor (1911) claimed that workers are motivated almost entirely by money
    - Not true, also for mastery, growth, and satisfying interpersonal relationships
- Cultural factors influence work motivation
    - In Japan, employees adopt a concept of Kaizen (continuous improvement), encouraging workers to develop skills and increase productivity
    - The company, in return, assumes responsibility for the employee's welfare, promote them slowly, and are willing to retain them for life
    - The company becomes an integral part of the worker's identity

Job Satisfaction and Performance

- Job productivity and job satisfaction are weakly related
- Absenteeism and turnover
    - Dissatisfied workers tend to be absent more often and have a higher turnover rate

Enhancing Work Motivation

Enriching and Redesigning Jobs

- **Job enrichment** programs are an attempt to increase intrinsic motivation by making jobs more fulfilling and providing workers with opportunities to grow
- Jobs are most intrinsically satisfying when:

    - Skill variety: variety of tasks must be performed that require different skills
    - Task identity: a whole product is completed from beginning to end
    - Task significant: task should have a strong impact
    - Autonomy: worker has some freedom to determine work procedures and schedule
    - Job feedback: job has clear feedback about performance effectiveness
- Job enrichment has promoted better work outcomes in manufacturing plants, white collar and police organizations, and other work settings

Modifying External Incentives

- Learning theory predicts that performance will increase when reinforcers are made contingent on productivity
- Union National Bank pays its workers for the number of accounts opened
- Other employers used praise and recognition to reinforce desired employee behaviors

Goal Setting and Management by Objectives

- Goal setting is a motivational technique that has increased employee productivity as well as **management by objectives** (combination of goal setting with employee participation and feedback)
- Employee participation is a second component of MBO
    - Meet with managers at least once a year to create goals and how to follow through with them
- Third component of MBO is objective feed back
    - Provides opportunities to recognize success and encourages a search for new methods to reach them
- MBO has increased productivity by 97% in 70 case studies

Motivational Conflict

- Motivational goals sometimes conflict
    - Eg. Achievement and affiliation goals may conflict when you have to choose between studying or partying
- Approach and avoidance are two conflicting tendencies
- When sometimes attract us we tend to **approach** it
- When sometimes repels us we tend to **avoid** it
- **Approach-approach conflict** involves opposition between two attractive alternatives
    - Selecting one means losing another
        - Eg. 2 desirable career paths
- **Avoidance-avoidance conflict** is when a person faces two undesirable alternatives
    - Eg. Choosing to study for a boring subject or not study and fail the exam
- **Approach-avoidance conflict**
    - Being attracted and repelled by the **same goal**
        - Eg. Wanting to open the door to get out, but is afraid of getting shocked by the door
    - As we approach the desired goal, our desire to avoid it both get stronger as we get nearer to it
- **Delay discounting** refers to the decrease (discount) in the value of a future incentive
    - Eg. Choosing to watch TV for immediate incentive or start working on an essay to focuses on future incentive; writing the essay has lesser motivation because it is further away
- Some methods of coping with motivational conflict can be maladaptive
    - **Defensive avoidance:** decision maker procrastinates and avoids coming to

grips with the decision

The Nature and Functions of Emotion

- **Emotions** are positive or negative feeling states consisting of a pattern of cognitive, physiological, and behavioral reactions to events that have relevance to important goals or motives
- Motivation and emotion are closely linked
    - Involve states of arousal and can trigger patterns of action
    - Lazarus claims that there is always a link between motives and emotions because we react emotionally only when our motives and goals are gratified, threatened, or frustrated
- Some theorists suggest that motives operate as internal stimuli that energize a behavior and emotions are reactions to events that relate to important goals

The Adaptive Value of Emotion

- Signals that something important is happening and direct our attention to that event
    - Eg. Our decision regarding fighting or fleeing is intensified our emotions of anger or fear
- Negative emotions tend to narrow attention and action tendencies so that the organism can respond to a threatening situation with a focused set of responses
- Positive emotions arise under conditions of safety and goal attainment broaden our thinking and behavior so that we explore, consider new ideas, try out new ways to achieve goals, play, and savor what we have
- Emotions are a form of communication and affect how others behave toward us
    - Eg. Adults feel distressed, disturbed and sympathetic when babies cry
        - Respond with caretaking behavior

The Nature of Emotion

- Emotions we have share 4 common features
    1. Emotions are responses to external or internal eliciting stimuli
    2. Emotional responses result from out interpretation or **cognitive appraisal** of these stimuli, which gives the situation its perceived meaning and significance
    3. Our **bodies respond physiologically** to our appraisal. We become physically "stirred up", as in fear, joy, or anger, or we may experience decreased arousal, as in depression
    4. Emotions include **behavior tendencies.** Some are **expressive behaviors** (eg. Exhibiting surprise, smiling with joy). Others are **instrumental behaviors**, ways of doing something about the stimulus that aroused the emotion (eg. Studying for an anxiety arousing test, fighting back in self defense, running away.)

Eliciting Stimuli

- Emotions are responses to situations, people, objects, or events
- Stimuli that trigger cognitive appraisals and emotional responses are not always external; they can be internal stimuli
- Innate biological factors help determine which stimuli have the greatest potential to arouse emotions
    - Fear responses to snakes and spiders happen more easily than fear of flowers
- Cultures have different ways to setting the bar for the good and the bad
    - Eg. Bars through the nose may stimulate sexual arousal in one culture and disgust in another

The Cognitive Component

- Cognition is involved in our subjective interpretation of different stimuli

Appraisal Processes

- Appraisal is related to what we think is desirable or undesirable for us or for the people we care about
- We may not be consciously aware of it; some appraisals involve little more than an almost automatic interpretation of sensory input
    - Eg. A truck coming towards you, you would automatically feel fear and get out the way
- As we develop cognitively, our appraisals are more likely to be tied to language
- Cognitive appraisal help explain that people have different emotions to the same stimuli

Culture and Appraisal

- In a study involving 27 cultures, researchers found strong cross cultural similarities in the types of appraisals that evoked joy, fear, anger, sadness, disgust, shame, and guilt
- Americans felt more happiness, and pride more frequently than Japanese or Hong Kong people
    - Despite this, similar appraisals were involved regardless of culture
- Same situations can evoke different appraisals depending on culture
    - Tahitians: being alone causes fear because it gives bad spirits a chance to bother the person
    - Utku Inuit: alone is a form of social rejection and evokes feelings of sadness and loneliness
    - Western society: may see alone time as a good break from their fast paced lifestyle

The Physiological Component

Brain Structures and Neurotransmitters

- Emotion involves important interactions between cortical and subcortical areas
- Subcortical areas such as the hypothalamus, the amygdala, the hippocampus, and other limbic system structures play major roles in emotions
    - Stimulation of certain parts of the limbic system causes aggression and removal of it causes the lack of aggression
- The ability to regulate emotion depends heavily on the executive functions of the **prefrontal cortex**
- The amygdala helps coordinate and trigger physiological and behavioral responses to emotion arousing situations
- The cortex evaluates the information through the "thinking" part of the brain
- Upon receiving information, the thalamus can transfer the input directly to the amygdala which allows a faster reaction
- Fig. 439
- De Loux suggests that some people can have two simultaneous emotional reactions to the same event
    - A conscious one due to the cortex
    - An unconscious one due to the amygdala
- Many of our emotional responses are based on previous learning experiences
    - The amygdala has the ability to learn things
        - Removing a rats visual cortex meant that the rat can't consciously perceive light. However, when a light is paired with an electric shock, the rat learned to fear it because of the amygdala
- The hippocampus damage causes memory impairment, but they can still be classically conditioned to emotional responses even though they cannot consciously learn the connection between the CS and the UCS
- Those with amgydala damage, but okay hippocampus can describe the CS-UCS

contingency but does not develop conditioned fear
- Dopamine activity appears to underlie some pleasurable emotion as well as endorphins
- Serotonin and norepinephrine play a role in anger

Hemispheric Activation and Emotion
- It is noted that when electric current knocked out the left hemisphere (right hemisphere in charge) patients had catastrophic reactions; conversely, when the right hemisphere was knocked out, the left hemisphere took charge and produced happy and even euphoric reactions
    - Similar patterns were displayed by lesions and strokes
- Davidson and Fox used EEG to measure the frontal lobe activity as people experienced different emotions
    - People felt happy emotions had more left hemisphere activity
    - When people felt sad or other negative emotions are evoked, the right hemisphere became more active
- People have different resting hemispheric dominance
    - Those with more right hemisphere dominance were more likely to become upset than those with left hemisphere dominance

Autonomic and Hormonal Processes
- The sympathetic nervous system produces the fight or flight response through the endocrine system and arouses the body in mere seconds
- Complex and subtle emotions such as jealousy and tenderness do not involve distinct patterns of arousal while autonomic patterns such as fear and anger shows subtle differences
    - In fear and anger, blood goes to different places
- We cannot easily control autonomic nervous system activation with exposure to emotion evoking stimuli
    - This led to lie detectors because when someone is lying, they should have an increase in anxiety
    - This is measured with a **polygraph**
        - Still flawed; someone lying can remain calm and someone telling the truth can be anxious

The Behavioral Component

Expressive Behaviors
- We can often infer that someone is angry, sad, fearful, or happy on the basis of his or her **expressive behaviors**
- Sometimes other peoples' emotional displays can evoke emotional responses in us in a process known as **empathy**
    - Eg. Sympathizing with the characters in a movie

Evolution and Emotional Expression
- Darwin argued that emotional displays are products of evolution because they helped survival
    - EG. Both people and wolves bar their teeth when they are angry because it shows that they are ferocious and makes them less likely to be attacked
- Humans have innate, or **fundamental emotional patterns**
    - Certain expressions such as rage and terror are similar across a variety of cultures
    - Blind children express these emotions so it rules out observational learning
- The basic emotions are assumed to apply across all cultures but appear later in a child's development than do the positive and negative effect observed in infants

- The third level consists of more subtle emotions derived from basic emotions
    - These emotions are more heavily influenced by cultural learning
        - Eg. Western societies differentiate between passionate love, friendship love, possessive love, etc. while in India there is only mother love and erotic love

Facial Expression of Emotion

- We tend to concentrate on what the face tells us
- Only monkeys, apes, and humans have enough well developed facial muscles to produce a large number of facial expressions
- Facial expressions are measured by complicated systems such as the Facial Action Coding System (FACS)
- Common lore says that eyes can tell the most, but other parts of the face are at least equally important
    - Different parts of the face provide the best indicators of different emotions
        - Eg. The eyes provide the most important cues for fear and sadness and the mouth is a major cue for happiness and disgust
- People within the same culture can express emotions differently
- The same expression can be used to varying circumstances
    - Eg. Crying can be because a loved one just died, or because you just won a lottery ticket
- Women are generally more accurate judges of emotional expressions than men
    - Perhaps it has a greater adaptive significance for women because they are usually the caretakers in the family
    - Men who work in professions that emphasize these skills (psychotherapy, drama, art) are as accurate as women
- In basic emotions (happiness, disgust, surprise, etc) there is high agreement across cultures
- Matsumoto and Willingham's analysis of athletes after winning their gold metals show that facial expressions that are displayed spontaneously in an emotion evoking situation can be considered universal

Cultural Display Rules

- **Display rules** are the norms for emotional expression within a given culture
    - Certain gestures, body postures, and physical movements can convey different meanings in different cultures
        - Eg. Thumbs up in Greece is equivalent to the middle finger in North America
- The Display rules of a particular culture dictate when and how particular emotions are to be expressed
    - Eg. The Japanese does not like to display emotion in public

Instrumental Behaviors

- **Instrumental behaviors** are directed at achieving some goal
    - Anxious student finding a way to cope with an impending test
- Instrumental behavior fall into 5 broad categories
    1. Moving toward others (eg. Love)
    2. Moving away from others (eg. Fear, revulsion)
    3. Moving against others (anger)
    4. Helplessness
    5. Subnission
- As physiological arousal increases to an optimal level, performance improves, but beyond that level, further increase impairs performance

- Task complexity affects the optimal arousal level
    - As complexity increases, the level of optimal arousal for maximum performance decreases
- For complex tasks, high emotionality can interfere with the ability to attend to and process information effectively
    - Anxiety may cause people to underperform in complex situations such as air traffic control
    - In physical tasks, muscle tension can interfere with the skilful execution of complex movements

Interactions Among the Components of Emotion

The James-Lange Somatic Theory (1890)

- This theory claims that the body informs the mind; our physiological reactions determine our emotions
    - We know we are afraid only because our bodily reactions tell us so

The Cannon-Bard Theory (1927)

- People's bodies do not respond instantaneously to an emotional stimulus; several seconds may pass before signs of physiological arousal appear
    - Yet people feel emotion immediately, which means that the James-Lange theory is inconsistent
- The **Cannon-Bard theory** proposed that when we encounter an emotion arousing situation, the thalamus simultaneously sends sensory messages to the cerebral cortex and to the body's internal organs

The Role of Autonomic Feedback

- Cannon severed the nerves that provide feedback from internal organs to the brain
    - Even after the sever, animals still exhibited emotional responses, supporting his theory over that of James and Lange
- People who have spinal injuries and a paralyzed did not feel a difference in the intensity of their emotional feedback

The Facial Feedback Hypothesis

- The muscles in the face plays a key role in determining the nature and intensity of emotion that we experience
    - Eg. Those who held pencils in their teeth felt happier than those who held pencils in their lips
        - This is because holding the pencil in their teeth puts the participants into a smiling facial expression
- According to the **vascular theory of emotional feedback**, tensing facial muscles alters the temperature of blood entering the brain by controllin gthe volume of air inhaled through the nose
    - Cooling the blood increases positive affect, whereas warming it produces negative effect

Cognitive Affective Theories

- Focuses on the way in which cognitions and physiological responses interact
- Lazarus emphasizes that all emotional responses require some sort of appraisal, whether we are aware of that appraisal or not
- This differs from the Cannon-Bard theory because the Cannon-Bard theory claims that one's emotional response depends on the stimuli
    - Eg. You see a bear and it causes fear
- The Cognitive Affective theory claims that when you see a bear, you may have

different appraisals and may elicit emotions of awe

- Schachter's **two factor theory of emotion** states that arousal and cognitive labelling based on situational cues are the critical ingredients in emotional experience
    - Intensity of physiological arousal tells us how strongly we are feeling something
    - Situational cues give us the information we need to tell us what we are feeling

Chapter 11: Development of the Life Span

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Major Issues and Methods

- **Nature and Nurture**
- **Critical period:** an age range in which certain experiences must occur for development to proceed normally along a certain path
- **Sensitive period:** an optimal age range for certain experiences, but if they occur at other ages, normal development is still possible
- **Continuity versus discontinuity:** develop is a continual/gradual fashion or in distinct stages
- **Stability versus change:** Do our characteristics remain consistent as we age
- 5 different developmental patterns
    1. No change: ability present at birth constant throughout lifespan
    2. Continuous change: ability not present at birth develops slowly over the lifespan
    3. Stages: ability progresses in stages with rapid shifts from a lower level to a higher one
    4. Inverted U-shaped function: emerges at birth, peaks at an older age, and disappears over time
    5. U-shaped function: ability present early in life, disappears temporarily, and re-emerges later
- **Cross sectional design:** compare people of different ages at the same point in time
    - Problem: people in different age groups (cohorts) may perform differently because they grew up in different time periods; IE. Those grew up in the 40's may not have had great access to education and nutrition
- **Longitudinal Design** is repeating the test for the same cohort as it grows older
    - Problem: People move, drop out of the study, and die; Also, if one finds a pattern (intelligence drops at age 60), is this due to the unique experience of the particular cohort?
    - **Sequential Design:** test several age cohorts as they age

Prenatal Development

- 3 stages
- **Germinal Stage:** first 2 weeks of development when the sperm fertilizes the egg
- **Embryonic Stage:** extends from the end the germinal stage: the placenta and the umbilical cord develop in this stage
    - **Placenta:** contains membranes that allow nutrients to pass from the mother's blood to the umbilical cord
    - **Umbilical Cord:** contains blood vessels that carry these nutrients and oxygen to the embryo
    - Organs begin to form in this stage; heart starts beating by week 8
- **Fetal Stage:** starts in week 9 till birth
    - 24 weeks: eyes open
    - 29 weeks: fetus attains the **age of viability:** can survive outside the womb should a premature birth occur

Genetics and Sex Determination

- XX: female

- XY: Male
- Y chromosome contains the TDF gene which triggers male sexual development
    - Triggers testes development at 6 to 8 weeks
        - Testes produce androgens which is linked to male pattern of organ development
        - If TDF is not present, testes do not form and female characteristics are developed

Environmental Influences

- **Teratogens** are environmental agents that cause abnormal prenatal development
    - Placenta prevents many dangerous substances from reaching the embryo
- Stress hormones can cross the placenta and prolonged stress can cause premature birth, infant irritability, and attention deficits
- Heroin and cocaine user's babies often born addicted and go through a withdraw period
- **Fetal Alcohol Syndrome** are a group of abnormalities resulting from prenatal exposure to alcohol which include facial abnormalities, small malformed braines, and small stature
- Major cause of mental retardation
- Not all fetuses exposed to alcohol have FAS, some show no symptoms
- Less severe problems (executive function, learning, etc) are known as Fetal Alcohol Effects
- The most sensitive period is during sensitive periods of fetal brain growth, around the end of the first month and during the last two months of pregnancy
- During the third trimester, infants have higher heart rate and greater body movement when they hear a loud noise
- Fetuses can learn: they learn to stop responding to a constant sound or a sound that is repeated during fetal developmen

Infancy and Childhood

The Amazing Newborn

New born Sensation and Perception

- New born babies have poor visual acuity and have a very small visual field
- Within minutes, they are able to turn to face visual, audio, and tactile stimuli
    - Particular responsive to mother's face, voice, and smell which enhances its access to food, warmth, and social stimulation
- **Preferential looking procedure:** show them 2 stimuli at the same time and see which one they have a viewing preference
    - Preferred complex patterned images over unpatterned
    - Prefers mother's face over stranger's face
        - Recognizes hairline because of their poor visual acuity
- **Visual habituation procedure:** same stimulus is presented repeated until the infants looking time declines
    - When presented the stimulus again with some other stimulus, they prefer the new stimulus
- Infants are able to recognize different color

Newborn Learning

- Newborns are able to discriminate different sounds and get bored of the same stimulus
- Newborns rapidly acquire classically conditioned responses
    - Researcher followed a touch on the head with the delivery of milk
        - When the touch was presented, the infant turns toward the researcher

        - If milk was not followed, they sometimes get upset
    - Researchers have got infants to imitate their behavior
        - This helps infants identify people and engage them in social exchange

Sensory-Perceptual Development

- Visual field expands to adults size by 6 months old
- Visual acuity improves to 20/100 by 6 months and 20/20 by 4 years of age
- U shaped function exists for sound localization
    - Impressive at birth disappears in 2nd month of life but reappears at 4 to 5 months of age
- Auditory pattern perception is relatively advanced and they are bale to differentiate one word from another (phenomes) by 1 to 2 months of age
    - Eg. Can differentiate between "bah" and "dah"
    - Can differentiate phenomes not found in their native language
- In the first half year of life infants perceive music as adults do, looking for consonant sounds over dissonant sounds
    - Possible that humans' communication system was composed of melodies rather than words

Physical, Motor, and Brain Development

- **Maturation** is the genetically programmed biological process that governs our growth
- Physical and motor development follows several principles
    1. **Cephalocaudal Principle:** tendency for development to proceed in a head to foot direction
    2. **Proximodistal Principle:** development begins along the innermost parts of the body and continues to the outermost parts
- Brain grows the fastest
    - Infant brain is about 25% of mature size, by 6 months it is 50% of mature size
    - Cells become larger, axons develop myelin sheaths,
    - Develops in an orderly fashion
        - The brain stem develops first (heartbeat and breathing)
        - Frontal cortex (higher cognitive thought) develops last
    - 5 year olds have reached 90% of adult brain size
    - Little size changes between 5 and 10 years of age although maturation continues in making new synapses
- **Reflexes** are automatic inborn behaviors elicited by specific stimuli present at birth
    - Some have adaptive value such as breathing, and sucking
    - Others have less adaptive behavior such as grasping objects, attempting to swim in water, trying to walk when held upright
- Motor skill such as walking follow a U-shaped development
    - Drops out after 2 months and reappears around 12 months when North American infants attempt to walk

Environmental and Cultural Influences

- Diet can cause malnutrition which can stunt growth and brain development
- They need physical contact from their caregivers
    - Infants who are regularly massaged gain weight more rapidly and show faster neurological development
- **Biology sets limits on environmental influences:** nutrients alone won't make an infant 7 feet tall
- **Environmental Influences can be Powerful:** nurturing environments foster physical, sensory motor, and psychological growth

- **Biological and Environmental factors interact:** Enriched environments enhance brain development

Cognitive Development

Piaget's Stage Model

- The brain builds **schemas** which are organized patterns of thought and action
- Cognitive development occurs as we acquire new schemas, and our existing schemas become more complex
    - **Assimilation** is the process by which new experiences are incorporated into existing schemas
    - **Accommodation:** process by which new experiences cause schemas to change
        - Instead of calling a horse a "big doggie", he realizes that the horse doesn't act like a dog at all
        - This imbalance causes the new experience to change existing schemas
        - Everytime a schema changes, the child's perception of the world changes as well

Sensorimotor Stage

- Lasts from birth to age 2, infants understand their world through sensory experiences and motor interactions with objects
- Reflexes are the earliest schemas
- As infants age, they realize that they can make things happen such as banging spoons, taking objects apart
- Before 6 months, if you take a toy away from a child, it is as if the object had disappeared
- By 8 months, they've developed **object permanence:** the ability to understand that an object continues to exist even when it disappears from sight
- They begin to speak at about age 1 and use their language to represent objects, actions, and needs

Preoperational stage

- Enter around age they represent the world symbolically through words and mental images
- Understand concepts such as objects are the same or different
- They become able to think about the past and the future and become better at anticipating the consequences of their actions
- Does not understand the concept of **conservation**, principle that object mass and volume are conserved
- Children's thinking display **irreversibility:** difficulty in reversing an action
- Children has **centration**: focusing on only one aspect of the situation, they don't pay attention to height and width, etc
- Display **animism:** attributing life like qualities to natural events (the sky is crying)
- Reflects **egocentrism:** difficulty viewing the world is another person's perspective
    - Everyone perceives things the same way that they do

Concrete Operational stage

- Lasts from age 7 to 12
- Children can perform basic mental operations concerning problems that involve tangible objects and situations
    - Understand reversibility and display less centration
- Understand serial order
    - Can organize things from shortest to tallest
- Can form mental representations

    - Able to draw a map to school
- Has difficulty in hypothetical thinking and are rigid
    - If asked to draw third eye anywhere on their body they would draw 3 eyes in a row because they are limited to the fact that eyes appear on their face

Formal Operation Stage

- Individuals are able to think logically and systematically about both concrete and abstract problems, from hypotheses, and test them in a thoughtful way
- Begin around age 11 to 12
- Begin to think more flexible when tacking hypothetical problems
    - Better answer for 3rd eye problem

Assessment of Piaget's Theory: Stages, Ages, and Culture

- Testing his theories around the world has shown that Piaget's cognitive tasks have shown that the gerneral cognitive abilities associated with Piaget's for stages appear to occur in the sam eorder across cultures
- However, researchers have found that culture influences cognitive development
    - Eg. In underdeveloped societies, children tend to show an age delay in their thought
- More evidence has shown that children acquire many cognitive skills at ages younger than Piaget had postulated
    - Baillargeon demonstrated that a 4 month old displayed a basic grasp of object permanence when they were tested on special tasks
- Cognitive development within each stage seems to proceed inconsistently
    - A child may perform at the preoperational level on some tasks and solve other tasks at a concrete operational level

Vygotsky: The Social Context of Cognitive Development

- Emphasized that children live in a social word and that cognitive development occurs in a socio-cultural context
- If Ray and Juanita have similar cognitive test scores and both have problem with conservation
    - After some help Juanita gets it but Ray doesn't
    - Vygotsky says they weren't on the same cognitive level to begin with
- Vygotsky introduces the concept of **zone of proximal development:** The difference between what a child can do independently, and what the child can do with assistance from adults or more advanced peers
- This shows functions that have not matured yet but are in the process of maturation
- People can provide experiences and feedback that move a child's cognitive ability forward within limits
- Having older siblings also stimulate cognitive development

Information Processing Approaches

- Cognitive development is best examined within an information processing framework
- Children have poorer information search strategies
    - When they compare 2 things, they do not search systematically for relevant details
    - Preschoolers have problems with cognitive flexibility and selective attention
- Zelazo showed that children have poor cognitive flexibility
    - Eg. When asked to sort a set of cards based on shape or color, they are able to do so; but when they are asked to switch from sorting one type to another, they fail at doing so
- **Information processing speed** improves during childhood especially from ages 8 to

12

- **Memory capabilities** expand greatly during childhood
  - Older children uses better memory techniques such as repetition and chunking
- **Metacognition** is an awareness of one's own cognitive processes
  - Older children display greater awareness of their own mental processes than do younger children
- Researchers who adopt an information processing approach believe that cognitive development is a continuous, gradual approach in which the same set of processing abilities become more efficient over time
- Neo-Piagetian theorists believe that children acquire new modes of processing as they age
- Others adopt a combination of gradual increase and stages

Theory of Mind: Children's Understanding of Mental States

- **Theory of mind** refers to a person's beliefs about how the mind works
- Adults assume that the mind exists, and it consists of various mental states such as knowledge, feeling, desires, intentions, etc.
- Children under 6 or 7 have very little understanding of how the mind works have difficulty inferring what others are thinking
  - Scenario: Susie places a candy bar inside a green box and leaves; the candy is taken out of the box and put inside a red bag; Susie comes back, where will she look?
  - 2 year olds will say that she will look inside the red bag because they assume that she knows what they know
  - 4 year olds will say that she will look in the green box because Susie doesn't know
- As children reach 3 years old, they develop the ability to lie
  - When asked if they peeked inside a box that they weren't supposed to look at, 1/3 lied and said they didn't
  - 80% of 5 year olds lied
  - However, they had difficulty with follow-up questions
- Infants make inferences about the adult's knowledge, intentions, and perspectives

Moral Development

- A major goal of socialization to help children recognize right and wrong based on the norms of social conduct

Kohlberg's Stage Model

- 3 Levels of moral reasoning
- Heinz dilemma:

  Heinz's wife was dying form cancer. A rare drug might save her, but the druggist who made the drug for $200 would not sell it for less than $2,000. Heinz tried hard, but he could only raise $1,000. The druggist refused to give Heinz the drug for that price even though Heinz promised to pay the rest later. So Heinz broke into the store to steal the drug.

1. **Preconventional Moral Reasoning:** based on anticipated punishment or reward
   a. Stage 1: focused on punishment; Heinz should steal the drug because if his wife dies, he will get into trouble
   b. Stage 2: focused on rewards; Heinz should steal the drug because his wife can keep him company
2. **Conventional Moral Reasoning:** conformity to social customs and principles
   a. Stage 3: seeks to gain others approval: people will think Heinz is a bad person if

he doesn't steal the drugs
    b. Stage 4: laws and duties are meant to be follow; Heinz should steal the drug because its his duty to take care of his wife
3. **Postconventional Moral reasoning:** based on well thought out moral principles
    a. Stage 5: recognizing both societal laws and individual rights into account; stealing breaks the law, but is justifiable for saving a life
    b. Stage 6: based on abstract ethical principles of justice that are considered universal; Saving life comes before financial gain even if the person is a stranger, thus stealing the drug is morally acceptable

Gender, Culture and Moral Reasoning

- As we age from childhood to adolescence, moral reasoning changes from preconventional to conventional levels
- In adulthood, postconventional reasoning is relatively uncommon
- Levels are in order
- Postconventional reasoning occurs more often among Westernized, formally educated, middle or upper class people than other settings
    - Critics point out that the principle is biased because other cultures highest moral values can be based on principles such as benevolence, non-violence, and respect for all life
- Carol Gilligan argued that Kohlberg's emphasis on "justice" is a male perspective
- Gender bias shows mixed results
- People with higher moral reasoning does not necessarily display more moral behavior

Personality and Social Development

Erikson's Psychosocial Theory

- Personality develops through confronting a series of eight major **psychosocial stages** each with a different crisis over how we view ourselves
- 4 crisis childhood and infancy
    - **Basic trust versus basic mistrust: (1 to 4)** from the care of parents, how adequately our needs are met, determine whether we develop a basic trust of mistrust of the world
    - **Autonomy versus shame and doubt: (4 to 6)** children become ready to separate themselves from their parents and exercise their individuality; if parents are harsh during toilet training or are restrictive, children develop shame and doubt about their abilities and later lacks the courage to be independent
    - **Initiative versus guilt:** (3 to 5) children are curious about the world; if they are held back or punished about their desires, their curiosity becomes suppressed
    - **Industry versus inferiority:** (6 to puberty) Children who experience and pride and encouragement in mastering tasks develop "industry," a striving to achieve; repeated failure and lack of praise for trying leads to a sense of inferiority

Attachment

- The only thing that baby ducks will follow is the first object they see within 24 hours of birth
    - This sudden biologically primed form of attachment is known as **imprinting**
    - Presents a critical period
- **Attachment** refers to the strong emotional bond that develops between children and their primary caregivers
    - In humans, there is no critical period, but there is a **sensitive period** in the first

few years of life that make us sensitive to attaching to our caregivers

- For many years people assumed that the infant caregiver bonding resulted primarily from the mother's role in satisfying the infant's need for nourishment
    - Harry Harlow proved this to be false
        - When given a wire surrogate with food and a cloth surrogate without food, the monkey became attached to the cloth mother
        - **Contact comfort** is more important in fostering attachment than the provision of nourishment
- Bowlby proposed that attachment during infancy occurs in three phases
    - **Indiscriminate attachment behavior:** newborns cry, smile, and voclaize toward everyone which evokes caregiving adults
    - **Discriminate attachment behavior:** around 3 months, infants direct their attachment toward familiar caregivers more than strangers
    - **Specific attachment behavior:** by 7 to 8 months, infants develop their first meaningful attachment to a specific caregiver
- As infants become more attachment focused, 2 anxieties occur
- **Stranger anxiety:** distress over contact with unfamiliar people emerging around 6 to 7 months and ending around 18 months
- **Separation anxiety:** distress over being separated from a primary caregiver, peaks around 12 to 16 months

Variations in Attachment

- **Mary Ainsworth developed the Strange Situation Test (SST)** for examining infant attachment
    - An infant first plays a toy in the presence of the mother. Then, a stranger enters the room and interacts with the child, while the mother leaves. Later, the stranger leaves and the child is alone. Then the mother returns.
- In the mother's presence, the infant is **securely attached**, moves around the room and react positively to strangers
    - Distressed when she leaves and happy when she returns
- 2 types of **insecure attached**
    - **Anxious resistant** infants are fearful when the mother is present, demand her attention, and are highly distressed when she leaves
    - **Anxious avoidant** infants show few signs of attachment and seldom cry when the mother leaves
        - Don't seek contact when she returns, but won't resist if she initiates it
- Usually, children who is better attended tend to be securely attached

Attachment and later behavior

- Early attachment has long term influences on children's adjustment
- Elementary school children who are securely attached are better adjusted socially, have a higher self esteem, and are better behaved in school
- Insecurely attached children are more likely to have behavioral problems, be overly aggressive, and show attention seeking behavior

Attachment Deprivation

Isolate monkeys and children

- When exposed to other monkeys, monkeys raised alone were indifferent, terrified, or aggressive
    - When they become adults, they cannot copulate properly
    - Some had to be artificially inseminated, and were abusive toward their first borns
- Victor, the Wild Boy of Aveyron, showed severe impairment and only limited recovery

after remedial training
    - Uncertain whether he was originally crazy
- In Czechoslovakia, two twins were forced to live in isolation beginning at 18 months
    - At age 7, they were found to be emotionally and socially retarded
        - Cognitive development of a three year old and language skills of a two year old
    - With their foster parents, they became attached, and their IQ increased to normal levels and became well adjusted adolescents
- Why did they recover but not Victor?
    - Victor was older, which meant less neural plasticity
    - Twins were cared for in a home with younger, non threatening preschool children

Children Raised in Orphanages

- Ceausescu orphanage in Romania: children raised in deplorable conditions in a state run orphanage
- Many children adopted by Canadian families
- Compared 3 groups matched for age and sex: early (before 4 months of age) and late (after 4 months of age)
    - After 1 year, the late adopted orphans were more insecurely attached than early adopted ones
    - After two years, the three groups did not differ on parental report, but when assessed on a separation reunion procedure, the late adoptees displayed more insecure attachment behaviors
- In higher quality orphanages, however, when they are adopted, they form healthy attachments with their adoptive parents
- Infancy is a sensitive period to which initial attachment to caregiver forms

The Daycare Controversy

- 60% of American and Canadian children are cared for during the day by someone other than a parent
- Effects of daycare
    - **Attachment:** as measured by the SST, daycare does not seem to disrupt infants attachment to their parents
        - However, if negative factors compound - daycare is poor, child spends many hours there, parents not sensitive to child at home - the risk of insecure attachment increases
    - **Other Parent Child Interactions:** compared to non daycare kids, infants and toddlers in daycare are slightly less engaged and sociable toward their mothers
    - **Long Term Effects:** Infants and preschoolers from low income families who receive high quality daycare tend to be better adjusted socially and perform better in elementary schools than their peers
        - In upper and middle income families, this seems to have very little carry over effect

Style of Parenting

- Two dimensions of parental behavior
    - **Warmth vs hostility**
    - **Restrictiveness vs permissiveness**
- Warm parents communicate love and caring for the child and respond with greater sensitivity and empathy to the child's feelings
- Hostile parents express rejection and behave as if they did not care about the child
- **Authoritative parents:** controlling but warm; establish clear rules that are enforced

consistently and reward children's compliance with warmth and affection; high expectations, caring and supportive; most positive childhood outcomes
- **Authoritarian parents:** exert control with a cold, unresponsive, or rejecting relationship; lower self esteem, less popular with peers and perform more poorly in school
- **Indulgent parents:** warm and caring but does not provide guidance and discipline that helps children learn responsibility and concern for others; immature and self centered
- **Neglectful parents:** provide neither warmth nor rules and guidance; children most insecurely attached; love achievement motivation; disturbed relationships with peers
- These trends continue throw adolescence and high school
- These studies do not elicit causation
    - Children who are more irritable, hostile, and have a difficult temperament tend to elicit harsher and less warm parenting behaviors
- A child's development is the result of many compounded factors such as genetics, environment, as well as parenting

Gender Identity and Socialization

- Parents play a role in helping children develop a **gender identity**, a sense of male or femaleness
- **Gender constancy** is the understanding that being male or female is a permanent part of a person
- As gender identity develops, children acquire **sex role stereotypes**, beliefs about what is appropriate for boys and girls
- **Socialization** is the process by which the acquire beliefs, values, and behavior from a group
- **Sex typing** involves treating others differently based on whether they are female or male
- Fathers tend to steer their male infants away from activities that are stereotypically feminine
- At a science museum, parents are more likely to explain the displays to boys than girls, parents assume that male children have a higher aptitude for science and math
- In obvious and subtle ways, the environment reinforces our behavior in sex appropriate behavior
- By age 7 to 8, stereotyping has been firmly implanted, children thinks that males and females have different personalities and should have different occupations
- As children enter junior high, they display more flexibility in thinking about gender

Adolescence

Physical Development

- Adolescence begins at **puberty**, a period of rapid maturation when a person becomes capable of reproduction
    - Hypothalamus stimulates the pituitary gland to increase hormone secrete with causes physical growth
    - Speeds maturation of **primary physical characteristics** (required for reproduction)
    - Also produces **secondary sex characteristics** (non reproductive physical features such as facial hair and boobs)
- **Menarche** is the first menstrual flow
- For boys, puberty begins with the production of sperm and the first ejaculation
- Occurs around 12 to 13 for girls and 14 for boys in North America

- Hormones that steer puberty can affect mood and behavior
    - Early maturation has more positive outcomes for boys than for girls because it helps with their physical strength and size and contribute to their popularity and self image
    - Early maturing girls, on the other hand, tend to increase eating disorders, smoking, drinking, and having problems in school

Cognitive Development

Abstract Reasoning Abilities

- Piaget's final stage of cognitive development, **formal operational thinking,** is attained in adolescence
    - More easily think about abstract and hypothetical issues from social justice to the meaning of life
- However, performance differs for different types of reasoning and partly depends on formal schooling and exposure to abstract scientific tasks

Social Thinking

- Adolescent thinking can be highly self focused in early teenage year (**Adolescent egocentrism**)
    1. Tend to overestimate the uniqueness of their feelings and experiences known as the **personal fable**
        a) Eg. My parents don't get me
    2. They feel that everyone is noticing how they look and what they do known as the **imaginary audience**
- More egocentric teens tend to underestimate negative consequences of risky behaviors such as unsafe sex and drinking

Social and Personality Development

Search for Identity

- Adolescents go through an **identity versus role confusion**
    - Can resolve positively, leading to a stable sense of identity
    - Can resolve negatively, leading to confusion over one's identity and values
- Many young men are in a state of **identity diffusion:** have not gone through an identity crisis, and remain uncommitted to a coherent set of values or roles
- Some adolescents are in **foreclosure:** adopting and identity without going through a crisis
    - Eg. Adopting peer or parental values without giving them much thought
- **Moratorium:** status in which they are currently experiencing crisis but have yet to resolve it
    - Want to establish a clear identity but don't know which way to go
- **Identity Achievement:** gone through a crisis and successfully resolved it
    - Adopted a coherent set of values and are pursuing goals to which they are committed
- Identity has multiple components
    - Gender, ethnicity, and member of a social group
    - How we view our personality and other characteristics
    - Our goals and values pertaining to areas we view as important, such as family and peer relations, career, religion, and so forth
- Culture plays an important role in identity formation
    - Eg. Those in individualistic societies refer to I as an autonomous individuals separating me form other people

Relationships with Parents

- Most adolescents do okay with their parents

    - In the 70s, 56% of American teens reported as getting along very well with parents and 41% reported as getting along fairly well
- Most conflict arise from chores, neatness, and bedtime and are usually low in intensity
- Fuglini's study shows that
    - Adolescents agreed with their parents' right to "make the rules" but more for some issues than others
    - Older adolescents felt it was less appropriate for parents to make rules
    - Girls believed their parents would grant them autonomy at a later age than boys did
    - There was somewhat more conflict with mothers than fathers, but regardless of gender, ethnic group, or age, conflict was low with both mothers and fathers
- Parent teen conflict is correlated with other signs of stress
- Teens who reported more conflict had higher levels of school misconduct, and more antisocial behavior
    - They also reported greater hopelessness, lower self esteem, and lower life satisfaction
- Conflict decreased when parents accurately perceived their teens' cognition and affect

Peer and Friendship Relationships

- Teens like to spend time hanging out with their friends
    - Adolescents spend more time with peers than doing any other activity and identify more with peers than adults
    - More likely in North America than Europe or Asia, where teens have a stronger emphasis on family
- Adolescent friendships are more intimate than at previous ages and involve greater sharing of problems and better mutual understanding
- In choosing friends, adolescents tend to select peers who are similar to themselves
- The amount of time spend with a group decreases and time spent with individual friends increases
- Peer relations play a part in separating from parents and establishing one's own identity
- Peer pressure increases the risk of misconduct such as cheating and skipping school
    - However, peer pressure against committing misdeeds can typically have stronger effects in inhibiting misconduct

Adulthood

Physical Development

- Young adults are at the peak of their physical, sexual, and perceptual functioning
- Max muscle strength is reach at age 25 to 30
- Physical status typically decline at mid life
    - Eg. Visual fields begin to shrink in the 20s and late adulthood causes tunnel vision
- Muscle become weaker and stiffer
- Basal metabolic rate, rate at which body converts food into energy, slows and produces a tendency to gain weight
- Women go through menopause and men's fertility gradually declines in middle age
- In young adulthood, 80% of the young adult's body is lean body mass (bone, muscle, organs) while by age 70, this has become 50-50
- By age 90, the brain has lost 5 to 10% of its early adult weight due to loss of neurons as we age

Cognitive Development

- Many theorists claim that a fifth cognitive stage exists called **post formal thought** in

which people can reason logically about opposing points of view and accept contradiction and reconcilable differences

Information Processing and Memory

- Cognitive function declines throughout middle and late adulthood
  - **Perceptual speed** (reaction time) declines steadily after the mid thirties
  - **Memory for New Factual Information** declines during adulthood and find it more difficult to remember new series of numbers, names and faces
  - **Spatial Memory** declines with age (where things and places are), remains constant in adulthood but starts to decline in the sixties
  - **Recall** declines more strongly than recognition

Intellectual Changes

- IQ scores begin to decline noticeably beginning between age 30 and 40
- In a Cross sectional research:
  - **Fluid intelligence,** such as inductive reasoning and spatial orientation, declined steadily after age
  - **Crystalized Intelligence**, such as memorizing facts, peaked around middle adulthood and begin to decline in late adulthood
- It is questionable whether older adult actually have less fluid intelligence or they lack it because they may have had less exposure to scientific problem solving in school
- Schaie et al. ran a longitudinal study that showed that there is not early decline in either fluid or crystallized intelligence
  - Most abilities are relatively stable or increases slightly throughout adulthood
  - Longitudinal and cross sectional studies both show that fluid intelligences begin to decline at a gage earlier than the crystallize intelligence
- Age causes a slower response and may take longer to learn something

Use it or Lose it: Maintaining Cognitive Functioning

- The perceived decline is heavily influenced by certain adults who had disproportionately high intellectual declines
- 70% of participants maintained their level of function between 67 and 74, 65% maintained it between 74 and 81
- People with above average education, cognitively stimulating job, marrying an educated spouse, and had stimulating hobbies are more likely to maintain their intelligence
- Low physical activity levels were associated with cognitive decline, especially in fluid intelligence
- One study got seniors to play Tetris five hours a week for 5 weeks, and afterwards, they had better reaction speeds than those who did not play

Older but Wiser?

- Wisdom is defined as having basic knowledge about human nature and social relationships; having procedural knowledge to make decisions, give good advice, and handle conflicts; understanding past, present and future aspects of relationships between family friends and people at work; being able to deal with uncertainty, given that the future can't be fully known
- In a test, participants were given a situation to assess
  - It showed that wisdom rose steadily from 13 to 25 and then remaining relatively stable through age 75
  - Older adults (average 73) displayed superior social reasoning
- This study is cross sectional and only longitudinal studies can solve this problem properly

Social and Personality Development

- Adults follow a **social clock**, a set of cultural norms concerning the optimal age range for work, marriage, parenthood, and other major life experiences

Stages and Critical Events

- Researchers view adult social development as a progression through age related stages
- Young adults go through **intimacy vs isolation** where they choose to open themselves to another person to form close relationships
    - This is a period when many people for close friendships, fall in love, and marry
- Middle adulthood brings issues of **generativity vs stagnation**
    - People achieve generativity by doing things for other people such as raising children and volunteering
- Adults over 60 accentuates the **integrity vs despair** crisis
    - They review the meaning of their life
    - Some will feel a sense of completion and success while other regret not living their lives in a more meaningful way

Marriage and Family

- Successful marriages are characterized by emotional closeness and physical intimacy, positive communication and problem solving, agreement on basic values and expectations, and a willingness to accept and support changes in the partner

Cohabitation

- Living together without being married
- In families 71% are married, 14% are common law, 15% are single parent families
- The probability of marriage from cohabitation depends partly on the socioeconomic status of the man
- Premarital cohabitation is associated with a higher risk of marital discord and subsequent divorce
    - Not causal, those who cohabit before marriage are different psychologically

What's love got to do with it? Culture and marriage

- Suppose a person has everything you want in a mate, but you did not love them, would you marry them?
    - Study shows that people from Western countries are less likely to do so while poorer countries are more in favor of the idea
- Students from collectivistic countries are more likely to believe that love is a prerequisite to marriage

Marital satisfaction, parenthood, and the empty nest

- Marriage satisfaction decline in the first few years
- Marital satisfaction decreases in the year or two after the first child is born
    - Women are more likely to leave their jobs, spend more time parenting, and feel that their spouse is not helping enough
    - Disagreement of labor division and parenting is a major contributor in marital satisfaction
- % of couples reporting that they are very satisfied typically is highest before or just as the first child is born, drops in child rearing years, and increases in the years after all the children have left home
    - Longitudinal studies did not find a rebound in late adulthood marital satisfaction and poses a challenge to the myth of the empty nest
- Married people are happier, have lower rates of chronic illness, depression, and stress and live longer than unmarried adults

Attachment Revisited

- Attachment for adults is similar to infants in that they are displayed in secure, avoidant, and resistant attachment styles

- Adults with a disproportionate behavioral problems have a history of insecure attachment

Establishing a Career

- A career makes us money but also defines a part of who we are
- Work gives us an outlet for achievement and feelings of success, gives us structure, counteracts boredom, and is a significant source of social interaction
- In childhood till the mid twenties, we enter a growth stage of career interests where we form initial impressions about the types of jobs we would or would not want to do
- This is followed by the **exploration stage** where we form tentative ideas about a preferred career and pursue the necessary education or training
- Many university students cannot accurately predict their future occupation
- From mid twenties to mid forties, people enter an **establishment phase** during which they begin to make their mark
- People like to change careers at least once after graduating from university
- By the end of that period, people enter a **maintenance stage** that continue through the rest of middle and late adulthood
    - Older workers tend to be more satisfied than younger workers
- Younger workers are more interested in salary and advancement while older workers seek job security
- In the **decline stage,** one's investment in work tends to decrease and we eventually retire
- All married women experience career gaps or postponed a career until their thirties for family reasons
    - This is primarily due to childbirth
    - Can also be caused by having to care for elderly parents
    - Women goes through **interrole conflict** where they try to juggle the demands of career and family

Mid-life Crisis

- Levinson's longitudinal study of 85 men and women found that many experienced a turbulent mid life transition between age 40 and 45
    - They begin to focus on mortality and realize that some of their life's dreams pertaining to career, family, and relationships would not come true
- Overall, there is no turmoil filled crisis in mid life
    - Satisfaction with life did not vary with age
    - People in middle age did not have higher rates of divorce, suicide, depression , or feelings of meaninglessness, or emotional instability

Retirement and Golden Years

- Many older adults look forward to retirement to more leisure time, volunteer work, and other work opportunities
- Decision to retire depends on feelings about the job, leisure interests, physical health and family relationships
    - More likely to retire if spouse was not working and marriage was satisfying

Death and Dying

- Terminally ill patients experience stages as they cope with impending death
    1. **Denial:** refusal to cope with impending death
    2. **Anger**
    3. **Bargaining:** Please let me live to see my grand child
    4. **Depression**
    5. **Acceptance:** resigning to a sense of peacefulness
- This is not the correct way to face death and is not experienced by everybody

- Elderly people are more accepting of their own deaths than any other age group

Chapter 16: Behavior in a Social Context

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Social Thinking and Perception

Attribution: Perceiving the Causes of Behavior

- In everyday life we often make **attributions,** judgments about the causes of our own and other people's behavior
    - Eg. Did Bill criticize Carl because he is rude, or was he provoked?

Personal versus Situational Attributions

- To understand the way people behave, it involves either personal or situational attributions
    - **Personal (internal) attributions** infer that people's behavior is caused by their characteristics
    - **Situational (external) attributions** infer that aspects of the situation cause a behavior
- 3 types of information determine the attribution we make （Eg. Kim finding Art class boring)
    1. **Consistency:** if the response is consistent over time
    2. **Distinctiveness:** Is Art the only class she finds boring, or does she find all her classes boring?
    3. **Consensus:** How do other people respond? Do other students find Art class boring?
- If all responses are high, then the course is actually terrible (situational attribution)
- If consistency is high, but distinctiveness and consensus is low, then Kim is overly critical

Attributional Biases

- **Fundamental attribution error:** we underestimate the impact of the situation and overestimate the role of personal factors when explaining other people's behavior
    - Eg. When told students to read a passage against or for Castro, and told them that their position was chosen by the debate coach, the students believed that it was the still the position of the writer. The readers don't pay sufficient attention to this situational factor
- When people have time to reflect on their judgments or are highly motivated to be careful, the fundamental attribution error is reduced
- When explaining our own behavior we tend to protect our self esteem by displaying a **self-serving bias**: making relatively more personal attributions for successes and more situational attributions for failure
    - Depressed people, often display the opposite attributional pattern, taking too little credit for success and too much credit for failure

Culture and Attribution

- Cultural influences affect how we perceive the social world
- Many studies show that attribution behaviors are unique of the Westernized world
- Culture influences our own behavior
    - Modesty is highly valued in China and university students take less credit for their success

Forming and Maintaining Impressions

Primacy vs Recency: Are First Impressions More Important?

- **Primacy effect** refers to our tendency to attach more importance to the initial

information that we learn about a person
    - New information can change our opinion but it has to work harder to overcome the initial impression because
        - We tend to be most alert to information we perceive first
        - Initial information may shape how we perceive subsequent information
    - Eg. If an athlete with high expectations for him performs below average, the coach can attribute it to fatigue, drop in motivation, instead of his intrinsic ability
- Forming quick judgments was helpful in evolution because it helps us distinguish friend from foe
- **Recency effects** take over as primacy effect decreases and we place greater importance on recent information

Mental Sets and Schemas: Seeing What We Expect to See

- Eg. When you meet a person who is described as cold, aloof, and distant, you view the person that way if he doesn't talk much and avoid eye contact. If you described the person as shy, the same behavior can be attributed to shyness.
- The description of the person creates a schema about how the person is likely to behave
- A **stereotype** is a generalize belief about a group or category of people and is a powerful type of schema
    - Eg. When participants were asked to judge the potential and intelligence of a girl, they were either told she comes from an upper middle class white collar family or a lower class blue collar family. People judged her abilities lower thought she came from the latter. These participants stereotyped the different classes of parents

Self-Fulfilling Prophecies: Creating What We Expect to See

- A **self fulfilling prophecy** is when people's erroneous expectations lead them to act toward others in a way that brings about the expected behavior
    - Eg. The person described as cold, distant, and aloof. Your behavior toward him may change in subtle ways such as smiling less, standing further away, or giving up earlier.
        - His reaction may have come from your behavior

Attitudes and Attitude Change

- An **Attitude** is a positive or negative evaluative reaction toward a stimulus, such as a person, action, object, or concept

Do Our Attitudes Influence Our Behavior

- A Chinese couple traveled to over 200 hotels but was only denied service one. When later asked, 90% stated that they would not serve Chinese people in their hotel.
- It appears that there is little evidence that attitudes predict behavior
- Stephan Kraus concluded that attitudes predict behavior in a modest degree
- 3 factors help explain attitude and behavior

1. Attitudes influence behavior more strongly when counteracting situational factors are weak
    - Financial incentives, conformity and obedience pressure may lead people to behave in ways that are at odds with their inner conviction
    - The **theory of planned behavior** is that our intention to engage in behavior is strongest when we have a positive attitude toward that behavior
    - When subject norms (what other people think we should do) support our attitudes and we believe that the behavior is under control we are most likely to elicit the behavior
2. Attitudes have a greater influence on our behavior when we are aware of them and when they are strongly held

3. General attitudes are better at predicting general classes of behavior, and specific attitudes are better at predicting specific behaviors

Does Our Behavior Influence Our Attitudes?

- We develop attitudes that are consistent with the way we behave
- Eg. Students were asked to do an extremely boring experiment and then had to tell the next participant that the experiment was very interesting. They were either given $1, $20, or no money for it. Afterward, they were asked to rate their experiment.
- Those who received $1 had the greatest rating of task enjoyableness
- The **theory of cognitive dissonance** states that people strive for consistency in their cognition
    - When two or more cognitions contradict, the person experiences **cognitive dissonance** and becomes motivated to reduce it (eg. I am a trustful person and I just told another student a boring task was interesting)
    - It predicts that in order to reduce dissonance, people will change one of their cognitions or add new cognitions
    - Those given $20 dollars are adding the cognition that $20 justifies the lie
    - Those give $1 dollar had no real monetary gains and convinced themselves the task was enjoyable to bring their cognition in line with their lie
- Behavior inconsistent with our attitude is called **counterattitudinal behavior**
    - It only produces dissonance if our actions are based on free will and not coercion
    - Dissonance is maximized when the behavior threatens our sense of self worth or produces negative consequences that were foreseeable
- Dissonance does not always lead to attitude change
    - People can reduce their dissonance by rationalizing their attitudes, or making excuses

Self-Perception

- People infer others' attitudes by observing how they behave
- The **self perception theory** states that we make inferences abut our own attitudes in observing how we behave
- One observes how one has acted, and infer how one must have felt to have behaved in this fashion
- The dissonance theory assumes that we experience heightened physiological arousal (tension produced by dissonance) when we engage in counterattitudinal behavior
    - When students were asked to write something good about a nasty tasting drink, they showed greater physiological arousal
- Research shows that the dissonance theory better explains why people change their views after behaving in ways that openly contradict their attitudes
- When the counterattitudinal behavior does not threaten one's self image, it creates less arousal

Persuasion

- When a **communicator** delivers a **message** through a **channel** to an **audience** within a surrounding **context**
- **Communicator credibility** is how believable the communicator is and is essential in effective persuasion
- Credibility has 2 major components: **expertise** and **trustworthiness**
    - Those who are an expert, presenting a truth, and presenting a point contrary to his or her interest is the most persuasive
- Communicators who are attractive, likable, and similar to us also persuade us more effectively
- Overall, a **two sided refutational approach** (present a side and then refuting the oppositions argument) is more effective

- Overall **moderate degree of discrepancy** with the audience is better than taking an extreme
    - The more expert and credible the communicator, the most discrepant the argument can be

The Audience

- There are two routes to persuasion, **central route to persuasion** where people think carefully about the message and are influence because they find the arguments compelling. The **peripheral route to persuasion** occurs when people do not scrutinize the message, but are influenced by the speaker's attractive ness or the message's emotional appeal
- The central route is more effective when it will actually affect us in some way
- People differ in their need for cognition
    - Some enjoy analyzing issues, others prefer not to spend much mental effort
- People with a low need for cognition are more strongly influenced by peripheral cues such as attractiveness of the speaker

Social Influence

The Mere Presence of Others

- Studies indicate that the mere presence of a coactor or a passive, silent audience tend to enhance performance
    - Bikers rode faster in a competition than against a clock
- Performance on learning tasks worsened when coactors were present
- Zajonc explains that the presence of others increases our arousal
    - As arousal increases, we become more likely to perform our dominant response
    - When a task is difficult, our dominant response is to make errors, but when the task is well learned our response is to perform the task correctly
- This is called **social facilitation**, an increased tendency to perform one's dominant response in the presence of others
    - Produces small but reliable effects on human performance

Social Norms: The Rules of the Game

- **Social norms** are shared expectations about how people should think, feel, and behave
    - Some are laws, but others are unspoken rules
- **Social roles** are a set of norms that characterizes how people in a given social position ought to behave
    - Eg. Spouse, policemen, professor
- **Role conflict** can occur when norms accompanying different roles clash

Culture and Norm Formation

- Even random groups can form norms
- When people were put into different experiments and discussed their experience, their retelling of their experience converged and formed a group norm

Conformity and Obedience

- **Conformity** is the adjustment of individual behaviors, attitudes, and beliefs to a group standard

Why Do People Conform

- **Informational social influence** is when we believe that others have accurate knowledge and that what they are doing is right
- **Normative social influence** is the award that comes from being accepted by other people while avoiding their rejection
- In Asch's line experiment, a group were asked to do a simple visual task, but only one person was a real participant

    - Some of the confederates gave wrong answers on purpose to see if the participant conforms to the obvious wrong answer
    - 1/4 of the participants never conformed, 1/4 conformed frequently, and the rest conformed once or a few times
    - Overall, participants conformed 37% of the time
    - Participants surveyed afterwards wanted to avoid making waves and avoid rejection

Factors That Affective Conformity

- Group size: conformity increased from about 5 to 35% as group size increased from 1 to 3 or 4 confederates
    - However, further group size increase did not make a difference
- Presence of a dissenter: When one confederate disagreed with the others, this greatly reduces the real participants' conformity even if the dissenter gave an incorrect answer
- If money was given for correct answers, candidates are less likely to conform
- From 1950 to 1990, the overall level of conformity has decreased
- Conformity tends to be greater among research participants from collectivist cultures

Minority Influence

- Minority influence is the strongest when it is very committed to its point of view
    - Dissenting minority may cause the majority members to change their view, at least on a private level
    - Minority influence is strongest when it maintains a highly consistent over time

Obedience to Authority

- There seems to be a transfer of responsibility when someone gives you an malevolent order and you are likely to follow it if it came from an authority figure

Factors That Influence Destructive Obedience

- Remoteness of the victim: If the learner was out of sight, the teacher was more likely to shock him
- Closeness and legitimacy of the authority figure: obedience was highest when the authority figure was close and perceived as legitimate
- Cog in a wheel: If the participant only had to perform some other aspect of the task and is not the one flipping the switch
    - Obedience increases when someone else does the dirty work
- Personal characteristics: Religion, affiliation, occupation, education, length of military service, and psychological characteristics of obedient vs disobedient participants, but differences were weak or non-existent

Lessons Learned: From the Holocaust to Airline Safety

- By arranging situations appropriately, most people can be induced to follow orders from an authority they perceive as legitimate, even when their actions harm innocent people
- During the holocaust, each Nazi felt as though they were cogs in a wheel and lessens their personal responsibility for mass murder

Detecting and Resisting Compliance Techniques

- Compliance techniques are strategies that may manipulate you into saying yes when you want to say no
- **Norm of Reciprocity** involves the expectation that when others treat us well, we should respond in kind
    - Using unsolicited favors in hopes you will feel pressured to respond in kind
- **Door-in-the-face technique:** a persuader makes a large request expecting rejection, and then presents a smaller request

    - The second request becomes like a compromise for the initial request and refusal of the first may make you feel guilty
- **Foot-in-the-door techniques**
    - Asking for a small request first and then follow up with a larger one
    - Better than directly asking for the larger request
- **Lowballing:** persuader commits you perform a behavior, but right before the behavior, he increases the cost of that same behavior
    - Telling a car is $8000, but asks the manager and says he can only sell it for $8400
    - Having committed, one feels easier to rationalize the added costs and feel obligated to the person to whom you've made the commitment

Crowd Behavior and Deindividuation

- There are many cases where crowds tell a distressed person to jump from a tall building
- Gustav LeBon suggested that the anonymity that exists in mobs leads to a loss of personal identity and a weakening of restraint that prompt people to perform behavior they would not individually - this is known as **deindividuation**
- Anonymity to outsiders was the key, conditions that make an individual feel less identifiable to people outside the group reduce feelings of accountability
    - Anonymity outside the group enhances the individual's identity with the group and to conform with group norms
- People were more likely to encourage a potential suicide jump when the group was large and it was dark outside
- In the Stanford Prison Study, the guards became more cruel and tough when they identify with other guards
- Reducing anonymity and increasing public accountability may be the most basic approach to counteracting deindividuation

Group Influences on Performance and Decision Making

Social Loafing: Failing to Pull your Own Weight

- Ringelmann studied how much weight a man can pull
    - When in a larger group, there is a deficit between their added personal effort and total group effort
- The tendency for people to expend less individual effort when working in a group than working alone is called **social loafing**
- Collective effort model:
    - On a collective task people will put forth effort only to the extent that they expect their effort to contribute to obtaining a valued goal
    - Social loafing is more likely to occur when:
        - People believe that individual performance within the group is not being monitored
        - The task (goal) has less value or meaning to the person
        - The group is less important to the person
        - The task is simple and the person's input is redundant with that of other group members
- Fatigue increases with social loafing and we are more likely to freeload of the group when we are tired
- Individualistic cultures exhibit more social loafing than people from collective cultures
- All male groups display stronger loafing than all female groups or mixed sex groups, possibly because women are more concerned with group outcome
- The whole is less than the sum of its parts

- Social loafing disappears when individual performance is monitored or when members highly value their group or the task goal
- On the other end, some members may engage in social compensation where they will work harder in a group than alone if they expect that their colleagues don't have the ability or will slack off

Group Polarization: Going to Extremes

- Groups are often called upon to make decisions because they are more conservative and less likely to go off the deep end
- This is true only if the group members are conservative to begin with
    - Their final attitude is likely to be more conservative
- However, if the group's view is more liberal and riskier, the group's decision tends to be more liberal or riskier
- This is known as **group polarization**: when a group of like minded people discuss and issue, the average opinion of group members tends to become more extreme
- **Normative social influence** is that individuals who are attracted to a group may be motivated to adopt a more extreme position to gain the group's approval
- The **Information social influence** is when people hear arguments supporting their cause that they have not heard before which validates original position

Groupthink: Suspending Critical Thinking

- The tendency for group members to suspend critical thinking because they are striving to seek agreement
- Group think is more likely to occur when a group
    - Is under high stress to reach a decision
    - Is insulated from outside input
    - Has a directive leader who promotes his or her personal agenda
    - Has high cohesion, reflecting a spirit of closeness and ability to work well together
- Some members are under direct pressure to stop rocking the boat
- Some serve as mind guards be preventing negative information from reaching the group
- The members begin to display self censorship which creates an illusion of unanimity in which each member comes to believe that everyone else seems to agree with the decision

Social Relations

Affiliation and Interpersonal Attraction

Why Do We Affiliate

- Some theorists argue that over the course of evolution, individuals who are predisposed to affiliate are more likely to survive and reproduce than those who were reclusive
    - Offers greater access to sexual mates, more protection from predators, labor division, and the passing of knowledge
- Craig Hill suggests that, psychologically, we affiliate for 4 basic reason: to obtain positive stimulation, receive emotional support, to gain attention, and to permit social comparison
    - **Social comparison:** comparing our beliefs, feelings, and behaviors to those of other people to help us determine whether we are eliciting a normal response
- University students who scored high on a personality test of **need for affiliation** made more friends during the semester than students who scored low
- People with high need for affiliation shows stronger psychological sense of

community, the feeling of being part of a larger collective and being engaged with others in pursuing common goals
- Situational factors can affect our tendency to affiliate
    - Fear inducing situations increase our desire to be with others
        - More likely to bond with stranger after major disasters
    - We prefer to be with people who have been through the same fearful situation
        - Open heart surgery patients prefer other roommates who had open heart surgery

Initial Attraction

- Attraction is the first step in most friendship and romantic relationships
- We interact with people who are physically closer (proximity)
    - Students in fixed seating is more likely to make new friends with students nearby
- **Mere exposure effect:** repeated exposure to a stimuli typically increases our liking for it as long as they are not unpleasant and we are not oversaturated
- People are most often attracted to others who are similar to themselves including psychological attributes, similarity of attitudes, beliefs, and values
    - This might be because we like the fact that people with similar attitudes validate our view of the world
- When opposite people attract, it is typically for a short period of time and what we find appealing now can be found unappealing in the future
- Men and women's rated desirability for a partner is highly correlated with physical attractiveness
    - This may be caused by the stereotype that "what is beautiful is good" and we assume that attractive people have more positive personality characteristics than unattractive people
        - Reinforced by popular media
- In movies, good looking characters were portrayed as more intelligent, moral, and sociable than less attractive characters
- People are often judged by the company they keep, and by associating with attractive people, we can boost our self esteem
- Most people are likely to have a dating partner whose level of attractiveness is similar to our own - **matching effect**
- This could be because the more attractive people are matched up first and are taken
- Compared to women, men show more interest in short term mating and perceive short term mates as more desirable

What Do Men and Women Seek in a Mate

- Men typically prefer younger women, whereas women prefer older men
- Men place greater value on a potential mate being physically attractive and possessing good domestic skills
- Women prefer men with mate's earning potential, status, and ambitiousness
- The **social structure theory** proposes that men and women display different mating preferences because society directs them into different social roles
    - Women typically has less power, lower wages, and less access to resources than men do
    - Men are generally socialized as breadwinners and women are typically homemakers
- The **social penetration theory** states that relationships progress as interactions between people become broader, involving more areas of their lives and deeper, involving more intimate and personally meaningful areas
    - Self disclosure (sharing innermost thoughts and feelings) plays a key role in

fostering close relationships
    - More emotional involvement and extensive self disclosure is associated with greater emotional involvement and relationship satisfaction
- The **social exchange theory** states that the course of a relationship is governed by the cost and rewards the partners experience
    - Rewards include companionship, emotional support, and satisfaction of other needs
    - Costs may include effort spent to maintain the relationship, arguments and conflict, etc.
    - The outcome is the rewards minus the costs
- Outcomes are evaluated against two standards
    1. Comparison level: the outcome that a person has grown to expect in relationships and it influences the person's satisfaction with the present relationship
    2. Comparison level for alternatives: focuses on potential alternatives to the relationship and it influences the person's degree of commitment

Love

- 5 types of love: parental love, erotic (sexual) love, self love, love for humanity, and love of God

Types of Love

- **Passionate love** involves intense emotion, arousal, and yearning for the partner
- **Compassionate love** involves affection, deep caring about the partner's well being, and a commitment to being there for others
- Both types contribute to satisfaction in long term romantic relationships
- Fig 16.26, the triangular theory of love
- The **triangular theory of love** focuses on intimacy, commitment, and passion

The Cognitive Arousal Model: Why Does My Heart Pound

- The **cognitive arousal model of love**, the passionate component of love has interacting cognitive and physiological components
- We experience high arousal in the presence of someone who we perceive as attractive and desirable
    - This model suggests that emotional arousal is actually caused by other factors and can be misinterpreted as love
    - This is known as **transfer of excitation:** arousal du to one source is perceived as being due to another source
- When participants are told to go on a bridge with an attractive experimenter, the arousal from the bridge was misinterpreted as love for the experimenter

Prejudice and Discrimination

- **Prejudice** refers to a negative attitude toward people based on their membership in a group
    - We prejudge people - dislike them or hold negative beliefs about them because they are a part of a group
- **Discrimination** refers to overt behavior: it involves treating people unfairly based on the group to which they belong

Overt and Covert Prejudice: Have Times Changed?

- Overt prejudice has declined over the past few decades
- Greenwald developed the **implicit association test** in which a series of word pairs such as black-pleasant and white-pleasant flashed on a computer screen
    - As soon as you see each pair, the task is to press a key as quickly as possible
    - In theory, people would react quicker if the perceived words were associated

with each other
    - A prejudiced person would press black-pleasant slower than white-pleasant

Cognitive Roots of Prejudice

- To organize and simplify our world, we have a normal perceptual tendency to categorize objects and people
    - This can help us react to the environment quickly and help us predict others' behavior
- Categorization leads to in group and out group perceptions
- **In group favoritism:** a tendency to favor in group members and attributes more positively
- **Outgroup derogation:** a tendency to attribute more negative qualitites to them than us
- **Out group homogeneity:** out group members are more similar to one another than in group members
    - We tend to think of people as hispanic or black and not their subgroups such as Cuban-American
- Categorization and in group biases lead us to respond quickly to out group members based on perceived group characteristics - stereotypes - rather than based on their individual characteristics
- When someone acts in contrast to their stereotype, people can either change their stereotypes or explain the exception's behavior in other ways
    - They can attribute a black person's success on special advantages, tremendous effort, and good luck and not his intrinsic ability

Motivational Roots of Prejudice

- The **realistic conflict theory** is that competition for limited resources fosters prejudice
- In US and Europe, hostility toward minority groups increase when economic conditions worsen
    - Prejudice is stronger when there is a perceived threat to one's in-group
    - Eg. Discrimination toward blacks is not related to personal gain, but the belief that white people as a group are in danger of being taken over
- The **social identity theory** states that prejudice stems form a need to enhance our self esteem
    - People express more prejudice after their self esteem is threatened
    - Self esteem is both person and in group
    - When someone threatens the group, our self esteem is threatened as well

How Prejudice Confirms Itself

- In an experiment, a white university participant is asked to interview a black or white person for a position
    - The interviewer sat further away, conducted shorter interviews, and made more speech errors when the applicants were black
    - Later research shows that when an applicant was treated with discrimination, he tended to make more speech errors, rated the interviewer as less friendly and was less composed
    - This shows that the interviewer's initial stereotype caused the interviewer to perform worse which confirms the interviewer's initial stereotype
- **Stereotype threat** proposes that stereotypes create a fear and self consciousness among stereotyped group members that they will "live up" to other people's stereotypes
    - Eg. Given that "blacks are not as intelligent as whites", black university students

who take intelligence tests perform worse
    - If the test was presented in a neutral way, the performance becomes less pronounced

Reducing Prejudice

- **Equal status contact:** prejudice between people is most likely to be reduced when they
    1. Engage in sustained close contact
    2. Have equal status
    3. Work to achieve a common goal that requires cooperation
    4. Are supported by broader social norms
- In the case of Brown vs. Board of Education, the ruling called that school segregation based solely on race violates the constitutional rights of racial minorities
    - However, follow-up studies showed that desegregation programs did not reduce racial prejudice and in some cases even increased
    - Why?
        - Condition of equal status is not met, perpetuated both groups' negative stereotypes of one another
        - Personal contact between intergroup members did not occur
        - Classroom focused on individual rather than group learning
        - Intergroup contact was not suppported by social norms
- When intergroup contact was placed in proper conditions where multiracial groups helped each other, discrimination decreased **(jigsaw program)**
- Adopting a common identity with each other also helps reduce prejudice among group members

Pro-Social Behavior: Helping Others

Why Do People Help?

- Socialization, modeling, and reinforcement play a key role in fostering pro social behavior and attitudes
- The **norm of reciprocity** states that we should reciprocate when others treat us kindly
- The **norm of social responsibility** states that people should help others and contribute to the welfare of the society
- We are reinforced with approval when we adhere to these norms and receive disapproval when we do not
    - Eventually we internalize pro-social norms and values as our own, enabling powerful self reinforcers such as pride, self-praise, and feelings of satisfaction
- Children are more likely to be pro-social when they are raised by parents with high moral standards
- **Altruism** is the desire to aid another without concern for oneself
    - Batson's **empathy altruism hypothesis** states that altruism exists and it is produced by empathy
- Female students' empathy for another female participant was increased or decreased by leading them to believe that her values were similar or dissimilar to their own
    - Female student was much more willing to take the partner's place in getting electrically shocked if their values were similar
- The **negative state relief model** proposes that high empathy causes us to feel distress when we learn of other's suffering
    - Helping them means decreasing our own distress

When Do People Help?

- Latane and Darley view bystander intervention as a 5 step process

1. Bystander will not help unless they notice the situation
2. Deciding whether or not the situation is an emergency; is someone really in danger?
    - We do this by social comparison, seeing how everyone else is reacting
3. There is a diffusion of responsibility when other are present; "if I don't help then someone else will"
4. Self efficacy (confidence): we believe that our effort to help will yield effective results
5. Intervention may not happen if the perceived costs are too high such as negative social consequences, appearing fooling by acting inappropriately

- **Bystander effect:** the presence of multiple bystanders inhibits each person's tendency to help
    - More inhibition if the strangers are strangers and not friends
- People are more likely help when they are in a good mood
- **Pre-existing guilt,** feeling guilty for something we recently done increases helping
    - Assisting others easy our guilt
- Observing a **helpful role model** such as donating blood, increases pro-social behavior

Whom Do We Help?

- Similarity: we tend to help people that are similar to us in dress, attitudes, nationality, or other characteristics
- Gender: women are more likely to receive help than men if the bystander is male. Men are women are equally likely to be helped by female bystanders
- Perceived responsibility: people are more likely to receive help when their need for aid is viewed as beyond their control.
- The **just world hypothesis** holds that people want to view the world as fair, and they perceive that people get what they deserve to get
    - This irrational blaming reduces the people's feelings of responsibility to help

Increasing Pro-social behavior

- Mandatory volunteerism
    - Mixed results; outcome probably depends on the personal rewards that volunteers experience and their increased awareness of human needs
- Exposure to pro-social models
    - Showing video to high school students with other high school kids giving blood increased donation by 17% vs a normal appeal to donation
- Developing feelings of empathy and connectedness help develop pro-social behavior
- Learning about factors that hinder bystander intervention may increase the tendency to help someone in distress

Aggression: Harming Others

Biological Factors in Aggression

- Genetics partially explains aggression
    - Animals can be selectively bred over generations to be less aggressive
    - Identical twins raised in different households with different social environments are more similar in their aggressive patterns
- Aggression helped our ancestors compete for mate, food, and shelter which increases our genetic viability
- Aggression increases when the hypothalamus is stimulated
- Destruction of certain areas of the amygdala will decrease aggression
- Different forms of aggression involve different neural circuits
- Aggression involves activity of the **frontal lobe** which plays a role in impulse control

- In humans and animals with low levels of **serotonin** may be more impulsive
- In animals, higher levels of testosterone contribute to greater social aggression: unprovoked acts designed to establish a dominance hierarchy among members
    - In humans, the association between aggression and testosterone is weaker and less consistent

Aversive Environmental Stimuli: Beyond Frustration

- Frustration is when a stimulus interferes with our progress toward a goal, often contributes to aggression
- The **frustration aggression hypothesis** states that
    1. Frustration inevitably leads to aggression
    2. All aggression is the result of frustration
- Both assertions have been disproved
- Frustration does increase the risk of verbal or physical aggression, but it is not the only outcome
    - People may exhibit despair, resignation, or other non aggressive ways to deal with the conflict
- Frustration can be caused by a wide range of stimuli such as pain, and provocation
- Crowding can trigger aggression
    - When people feel crowded and feel little control over the situation, they report higher stress, which increase stress hormones, and become less tolerable towards frustration
- Heat increases risk of frustration
    - Assaults, rapes, family disturbances, riots, increases during the summer months

Learning to Aggress: Reinforcement and Modelling

- Aggression is influenced by learning; if non aggressive animals are consistently victorious in fights with weaker animals, they become aggressive
- If the animal suffers a series of defeat early on, it becomes submissive
- Children become increasingly aggressive if a positive outcome was achieved
- The Bobo doll experiment demonstrates that children learn how to aggress from other role models

Psychological Factors in Aggression

- People develop several types of **self-justification** to make it psychologically easier to aggress toward others
    - Eg. Blaming the victim for imagined wrongs, thereby convincing themselves that the victim deserved it
    - Dehumanize the victims
    - Believing that others are doing more repulsive things
- The **attribution of intentionality** affects how we respond to provocation
- If we perceive that someone's negative behavior toward us was intended or controllable, we are more likely to become angry and retaliate
- Our degree of **empathy** for others influence how we react to provocation
- If someone offends us and apologizes, our likelihood of forgiving depends on how much we can understand their viewpoint
- People have different **ability to regulate emotions**
    - People with reduced frontal lobe activity may impair their ability to control aggressive impulses
- Freud believed that human aggression is instinctive and that aggressive impulses build up over time and eventually has to be released, and builds up again
- **Catharsis** is an act that discharges aggression and temporarily reduces our impulse to aggress

    - In a society that punishes aggression, to channel it, one must channel them into socially acceptable forms of aggression such as verbal debates, vigorous exercise, sports, hunting, etc
    - Another way is to discharge them vicariously through watching others behaving violently
- Sometimes, meek and unassertive people commit crimes and are described to have **over controlled hostility** showing little immediate reaction to provocation
    - Over time as pressure builds up, they explode and erupt into violence
    - 10 year old boy stabbed her sister 80 times after she changed the channel
    - After the aggressive outburst they revert to their former passive state
- Research shows that physical exercise and watching violent pornography makes it easier for people to commit violent acts

Media Violence: Catharsis versus Social Learning

- There is roughly 80% chance of violence on TV channels
- According to the psychodynamic theory, movie and TV violence should be a cathartic pot of gold
- Social learning theorists believe that it is a source of modeling for crimes
    - 40% of violent incidents on TV were initiated by the good guys whom the viewers see as an attractive role model
    - 75% of violent scenes contained no remorse or punishment
    - Only 15% portrayed long term negative consequences to violence
- Hundreds of studies conclude that the social learning view is generally correct and that people act more violently when there is a role model
- American children who have watched greater amounts of violence at age 8 is more likely to be violent at age 30
- Media violence exerts its effects in multiple channels
    - Viewers learn new aggressive behaviors through modeling
    - Viewers come to believe that aggression usually is rewarded, or at least, is rarely punished
    - Viewers become desensitized to the sight and thought of violence
    - Viewers' fear of becoming a target of crime or violence increases
- Boys tend to be more susceptible to media violence effects that girls
- Aggressive behaviors usually occur when there is a negative stimuli
- The presence of a cue similar to the movie they were watching triggers higher rates of violence

Chapter 12 Notes

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What Is Personality?

- **Personality** is the distinctive and relatively enduring ways of thinking, feeling, and acting

3 characteristics

1. Components of identity that distinguish a person from others
2. Behavior caused primarily by internal factors
3. Behaviors tend to fit together in a meaningful pattern, suggesting an inner personality that guides behavior

The Psychodynamic Perspective

Freud's Psychodynamic Theory

- Freud studied under Jean Charcot in treat a disease called *conversion hysteria*
    - Freud was convinced that it had to do with painful memories and feelings that were repressed or pushed out of awareness
    - When patients re-experienced these dreadful memories, their symptoms often improved
- He became aware of the unconscious mind's role and engaged in hypnosis, dream analysis, and free association to try to tap into it

Psychic Energy and Mental Events

- Instinctive drives generate **psychic energy,** which powers the mind and constantly presses for direct or indirect release
    - Eg. Sexual energy may be released through sex or other activities such as fantasizing
- Mental events can be *conscious, preconscious, or unconscious*
    - Conscious: mental events that we are aware of
    - Preconscious: memories, thoughts, feelings, and images that we are unaware at the moment but can be called into awareness
    - Unconscious: most important part of the mind; a dynamic realm of wishes, feelings, and impulses that lies beyond our awareness

The Structure of Personality

Divided personality into 3 structures

1. **Id**
    - Exists totally within the unconscious mind
    - Only structure present at birth and is the source of all psychic energy
    - Operates based on the **pleasure principle** and seeks immediate gratification regardless of rational considerations
2. **Ego**
    - Primarily in the conscious level
    - **Reality principle:** tests reality and decides when the id can safely discharge its impulses
3. **Superego**
    - Develops at 4 or 5 and is the repository for the values and ideals of society
        - Ideals are internalized through parents and society
    - Strives to control instincts of the id and tries to block out gratification

permanently
    - Might cause a person to experience guilt when having sex because they have internalized the thought that sex is dirty

Conflict, Anxiety, and Defense

- Personality is the interaction between the id trying to discharge its instinctive energies and the opposing forces from the ego and superego
- Anxiety causes the ego to deal with the problem at hand
- When realistic strategies fail, ego resorts to **defense mechanisms** that deny or distort reality
- **Repression** is the primary means to control the id
    - Repression is when the ego prevents anxiety arousing memories, feelings, and impulses form entering into consciousness
    - Repressed thoughts can be expressed through the defense mechanism **sublimation:** completely masking the forbidden underlying impulses
- **Table 12.1 Psychoanalytic Ego Defense Mechanisms**

Psychosexual Development

- Children pass psychosexual stages which the id seeks pleasure from **erogenous zones**
- Overindulgence or deprivation causes **fixation,** a state arrested psychosexual development in which instincts are focused on a particular sexual theme
- Most controversial of Freud's work
- **Table 12.2 Freud's stages of psychosexual development**

Research on Psychoanalytic Theory

- His ideas are hard to test in a controlled experiment
- Many of its concepts are ambiguous and difficult to operationally define

Evaluating the Psychoanalytic Theory

- Criticized on scientific grounds
- Many specific propositions have not held up under scrutiny of research
- Hard to test
    - Eg. If someone is supposed to act violently acts with affection, is the reaction wrong, is is the person using a defense mechanism called reaction formation?
- Research has shown that the unconscious has powerful effects on unconscious mental and emotional events

Freud's Legacy: Neoanalytic and Object Relations Approach

- Neoanalysts are people disagree with certain aspects of Freud's thinking and has developed their own theories
    - They believed that Freud did not consider social and cultural factors
- They believed that Freud focused too much on childhood determination of adult personality whereas they see it as a continuous development over the lifespan
- Alfred Adler claimed that humans are social beings that are motivated by the *social interest,* the desire to advance the welfare of others
- Adler also proposes a general motive of *striving for superiority* which drives people to compensate for real or imagined defects in themselves (*inferiority complex)* and strive to be more competent in life
- Carl Jung developed the theory of **analytic psychology**
    - Claimed that human beings have a *collective unconscious* that consists of memories accumulated throughout the entire history of the human race
        - Memories are expressed by **archetypes**, inherited tendencies to interpret experience in certain ways
        - Things such as image of a god, an evil force, the hero, and good mother

appear across cultures

- **Object relations** focus on the image or mental representations that people form of themselves and other people as a result of early experience with caregivers
    - These relations become lenses in which people view later social interactions
    - People who had better positive attachment to parents tend to have better romantic relationships

The Humanistic Perspective

- Emphasizes the central role of conscious experience and has a positive view of human nature
- Individuals strive for **self actualization:** the total realization of one's potential

Carl Roger's Self Theory

- Roger claims that human action is influenced by our experience of self and the environment

The Self

- **Self** is an organized, consistent set of perceptions of and beliefs about oneself
- People have a need for **self consistency** (an absence of conflict among self perceptions)
- People have a need for **congruence** (consistency between self perception and experience)
- When we experience anything that is inconsistent with our self concept, it evokes threat and anxiety
    - People choose to deny or distort their experiences to remove the incongruence
    - Eg. An inconsistency occurs when a man thinks that he is very attractive and a woman is not interested in him. He my distort reality and think that she's playing hard to get or he can distort the woman's reality and think that she doesn't realize how attractive he is.
- To preserve self image, people not only interpret situations in self congruent ways, but they also behave in ways that will lead others to respond to them in a self confirming fashion
- Level of congruence between self concept and experience define a person's adjustment
    - The more inflexible people's self concepts, the less open they will be to their experience and the more maladjusted they become

The Need for Positive Regard

- People are born with an innate **need for positive regard -** a need for acceptance, sympathy, and love from others
- Child gets **unconditional positive regard** from parents communicates the child that he is worthy of love
- **Conditional positive regard** depends on the child behaves
- We have a **need for positive self regard**
- Lack of unconditional love teaches people that they are only worthy of love and approval only if they meet certain standards
    - They develop **conditions of worth** that dictate when we approve or disapprove ourselves
- Eg. A child only gets positive regard from parents when she acts in a friendly way. When she feels angry, even when the feelings are justified, she may come to deny her feelings to preserve a self image of being totally self loving.

Fully Functioning Persons

- **Fully functioning persons** do not hide behind masks or adopt artificial roles and feel

a sense of inner freedom, self determination, and choice in the direction of their growth
- They can accept inner and external experiences as they are without modifying or distorting them

Research on the Self

Self Esteem

- Self esteem is how positively or negatively we feel about ourselves
- People with high self esteem are less susceptible to social pressure, have fewer interpersonal problems, are happier with their lives, achieve at a higher and more persistent level, and are more capable of forming satisfying love relationships
- People with low self esteem are more prone to psychological problems such as anxiety and depression, physical illness and poor social relationships and underachievement
- Children develop high self esteem when their parents communicate unconditional acceptance and love, establish clear guidelines for behavior, and reinforce compliance while giving a child freedom to make decisions and express opinions within those guidelines
- Unstable or unrealistically high self esteem may be damaging to the individual than low self esteem
    - When a person does well in school to improve his own self esteem, a failure can cause far more damage to a person's self esteem

Self Verification and Self Enhancement Motives

- Rogers proposed that people are motivated to preserve their self concept by maintaining self consistency and congruence (**self verification**)
- In one study, students were told adjectives about themselves
    - They showed better recall for adjectives that described them more accurately
- People with negative self images prefer to have spouses that held negative views of them as well
- People with positive self concepts tend to marry people that view them the same way
- People have a need to regard themselves positively known as **self enhancement**
    - People attribute success to their won abilities and failures to environmental factors
    - People rate their positive attributes as better than average
- These positive illusions contribute to their psychological well being

Culture, Gender, and the Self

- Culture provides a learning context in which the self develops
- Individualistic cultures emphasize independence and personal attainment
- Collective cultures emphasize connectedness between people and achievement of group goals
- Individualistic cultures are more likely to describe themselves using personal attributes (I am smart, I am clean) rather than social identities (I am the oldest son, I am a student)
- Gender role socialization provide us with **gender schemas** that tell us what is appropriate for males and females

Evaluating Humanistic Theories

- Relies too much on individual's report on their personal experiences
- It is impossible to define a person's self actualizing tendencies
- Rogers showed clinical effectiveness of his ideas

- The discrepancy between clients' **ideal selves** and **perceived selves** became less pronounced as they applied therapy

Trait and Biological Perspectives

- Trait theorists try to describe the basic classes of behavior that define personality
- Trait theorists begin by identifying behavior that define a particular trait

2 major approaches to define the building blocks of personality

1. One is to find specific behaviors that are correlated with one another and reflects a basic dimension

    Eg. People who are socially reserved tend to avoid parties, like quiet places, and enjoy being alone, others who are sociable and talkative like parties, dislike solitary activities, and constantly seek out new acquaintances. The basic dimension behind this is introversion-extroversion

Cattell's Sixteen Personality Factors

- Discovered 16 basic behavioral clusters
- Developed a personality test called the 16 personality questionnaire (16PF) to measure individual differences on each of the dimensions

Eysenck's Extraversion-Stability Model

- Proposed only 2 dimensions, and later added a third
- Composed of Introversion-Extraversion and Stability-Instability
- Stability: high emotional stability and poise
- Instability: moodiness, tendency to worry excessively, easily provoked guilt feelings, anxiety
- **Fig. 12.12b** Eysenck's model
- Later added psychoticism-self control
    - Psychoticism is someone who was creative and had a tendency toward nonconformity, impulsiveness, and social deviance

The Five Factor Model

- Believed that 5 factors capture a personality
- OCEAN: openness, conscientiousness, extraversion, agreeableness, and neuroticism
- **Table 12.4**

Traits and Behavior Prediction

- Mershon and Gorsuch ran a test that showed that Cattell's 16 traits were far more capable of predicting behaviors that the five factor model

Biological Foundations of Personality Traits

- Hans Eysenck linked the Introversion-Extraversion and Stability-Instability to differences in individuals' normal patterns of arousal within the brain
- He believed that introverts are **overaroused;** their brains are too electrically active and try to minimize stimulation and reduce arousal to get down to their optimal level
- Extraverts are **underaroused** and need power and frequent stimulation to achieve optimal level of arousal
- Unstable people have hair trigger nervous systems are easily shift in arousal
- Stable people show smaller and more gradual shifts in arousal

The Stability of Personality Traits

- Some personality dimensions are more stable than others such as introversion-extraversion
- Certain habits of thought may be fairly stable such as optimism-pessimism
- Personality shows a degree of stability and capacity to change

- May and Hartshorne did a study with thousands of children and gave them a chance to cheat, lie, and steal in multiple situations
    - The consistency through these situations were very low
    - University students may be conscientious with some things (coming to work on time) and not conscientious with others (handing in assignments on time)

3 factors make it difficult to predict personality traits in different situations

1. Personality traits interact with other traits in different situations
2. Degree of consistency across a situation is influenced by how important a given trait is for the person

    Eg. If honesty is important, he may show more stability in honesty
3. People differ in their tendency to tailor their behavior to what is called for by the situation
    - This is known as **self monitoring**
    - People who are high in self monitoring adapt their behavior according to the situation at hand
    - People with low self monitoring act based on internal beliefs and attitudes rather than the demands of the situation

Evaluating the Trait Approach

- More attention needs to be paid on how traits interact with one another
- Trait approach is more concerned with predicting behavior than understanding the psychological processes that produce the trait

Social Cognitive Theories

- **Social cognitive** theorists combine behavioral and cognitive perspectives and stresses the interaction of a thinking human with a social environment that provides experiences
- Behaviorists emphasize environmental causes of human reactions
- The cognitive principle of **reciprocal determinism** states that the person, the person's behavior, and the environment all influence one another in a two way causal link

Julian Rotter: Expectancy, Reinforcement Value, and Locus of Control

- Likelihood of behavior depends on expectancy and reinforcement value
    - **Expectancy** is our perception of how likely it is that certain consequences will occur if we engage in a particular behavior
    - **Reinforcement value** is how much we desire or dread the outcome that we expect the behavior to produce

Locus of Control

- **Internal-external locus of control** is an expectancy concerning the degree of personal control we have in our lives
- People with an internal locus of control believe they are in control of their own destiny
- People with an external locus of control believe that external factors determine their destiny
- People with a high internal locus of control are
    - more self determined
    - Achieve higher grades
    - Independent with cooperative in their dealings with others and more resistant to social influence

    - More likely to engage in health promoting behaviors such as exercise and eating right
    - Related to self esteem and feeling of personal effectiveness
- Increased dopamine is correlated with higher external locus of control

Albert Bandura: Social Learning and Self-Efficacy

Self Efficacy

- Self efficacy is their beliefs concerning their ability to perform the behaviors needed to achieve desired outcomes
- Self efficacy is determined by
    - Performance experiences (previous success vs. failure)
        - Shape our beliefs about our capabilities
        - Situation specific
    - Observational learning
        - If a person similar to yourself has accomplished a goal, then you are likely to believe that you will be able to do so as well
        - Eg. When someone broke a running record that physiologists said was impossible, a string of people began breaking it, thinking that is he can do it so can I
    - Verbal persuasion (encouraging or discouraging messages from others)
    - Emotional arousal (arousal that can be either enthusiasm or anxiety)
        - Anxiety or fatigue decreases self efficacy
- Self efficacy become a self fulfilling prophecy
    - Whether you believe you can do something or you believe you can't, you're probably right

Evaluating Social Cognitive Theories

- Has a strong scientific base and can be tested and researched with precision
- Suggests that the inconsistency in person's behavior is a manifestation of a stable underlying cognitive affective personality that reacts to certain features of situations

Personality Assessment

Interviews

- **Structured interviews** are used to collect research data or to make a psychiatric diagnosis and contain a set of specific questions that are administered to every participant
- Interviewers not only listen to what the interviewees say but how they say it
    - They look at their dress, mannerisms, expression and posture
- Information depends on the interviewee's desire to answer honestly and cooperate

Behavioral Assessment

- Psychologists devise an explicit coding system that contains the behavioral categories of interest
- They train observers until they show a high level of agreement

Remote Behavior Sampling

- Researchers collect samples of behavior from respondents as they live their daily lives
- A beeper randomly pings a respondent that will then record their thoughts and feelings at that time

Personality Scales

- Personality scales are objective measures that include standard sets of questions that

are true-false or scale format
- Can collect data from a lot of people at once
- Disadvantage is that people may not choose to answer truthfully
- Many tests use validity scales to detect tendencies to respond in a socially desirable manner

Items developed in 2 major ways

1. **Rational approach**
    - Based on theorist's conception of the personality trait to be measured
    - NEO-PI measures the Big Five personality traits
2. **Empirical Approach**
    - Previous research has shown that items were answered differently by groups of people known to differ in personality characteristics

Minnesota Multiphasic Personality Inventory (MMPI)

- Designed to provide an objective basis for psychiatric diagnosis

- The MMPI-2 has validity scales that were used to detect whether people answered to positively or too negatively

Projective Tests

- Tests the unconscious by presenting an ambiguous stimulus whose meaning is not clear and the interpretation of the stimulus will come partly form within

Rorschach Inkblot

- 10 inkblots
- Asks what they look like and why they think it looks like that
- People who see the inkblots as threats are more like to be projecting his/her own paranoid fears and suspicion into the stimuli
- Different examiners view responses differently and producing an unreliability
- John Exner developed a Comprehensive System to scoring these tests and improve test-retest reliability

Thematic Apperception Test

- **TAT** consists of a series of pictures derived from paintings, drawings, and magazines
- Subjects are asked to describe what is going on, what led up to the situation, and what the characters are thinking
    - Stories are analyzed for recurrent themes
- Also non-standardized and subject to judge interpretation
- Objective measures tend to be better than projective measures

Personality Theory and Personality Assessment

- Projective techniques are favored by psychodynamic theorists who believe that people's responses to tests such as the Roschach and TAT reveal unconscious processes
- Social cognitive researchers use behavioral assessments and ask people to rate their expectations about what will happen in the future
- Trait theorists favor paper and pencil inventories such as MMPI and the NEO-PI

Chapter 13 Notes

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Historical Perspectives on Psychological Disorders

The Demonological View

- Ancient view that deviant behavior is the work of the devil
- **Trephination:** release the evil spirit by chiseling a hole in the skull
- In medieval times, people with psychological disorders were labeled as witches and were hunted down

Early Biological Views

- Hippocrates: mental illnesses were a form of sickness, not evil spirits
    - Caused by the physical dysfunction of the brain
- In the 1800s, general paresis was a disorder caused by syphilis and was a breakthrough which linked psychological disorder to a physical malady

Psychological Perspectives

- Freud's psychoanalysis claimed that psychological disorders were caused by unresolved conflicts from childhood
    - Anxiety is dealt with defense mechanisms, which when used inappropriately, produced maladaptive behavior
    - **Neuroses:** psychological disease that does not involve a loss of contact with reality (depression, phobias, etc.)
    - **Psychoses:** psychological disease that causes a withdrawal from reality (schizophrenia)
- Behavioral perspective view disorders as a learned response
    - Tries to understand how the environment induces abnormal behavior
- Cognitive theorists emphasize people's thoughts and perceptions of themselves and the environment
    - Maladaptive thought patterns and self defeating
- Humanistic perspective view abnormality as factors that frustrate or pervert a person's self actualizing tendencies
- Socio-cultural perspective has grown in importance in the past

Today's Vulnerability Stress Model

- Everyone has a certain degree of **vulnerability** which stems from biological basis, cultural factors, etc
- When a **stressor** (event that requires a person to cope) appears, people's vulnerability determines whether they will suffer a psychological disorder

Defining and Classifying Psychological Disorders

What is Normal

- Depends on time and culture
    - Drapetomania was when a slave has an intense desire for freedom
- 3 criteria for abnormal behavior
    1. If behavior is intensely distressing to an individual
        - Inordinately anxious, upset, depressed, etc.
    2. Behavior is dysfunctional either for the individual or for society
        - Eg. Preventing someone from having normal relationships or work
    3. Society deviance

        - There are both coded laws and unspoken norms people are supposed to follow
- **Abnormal behavior:** behavior that is personally distressful, personally dysfunctional, culturally deviant

Diagnosing Psychological Disorders

- Classification is the first step to discussing psychological disorders
- Classification system has to meet standards of reliability and validity
- **Reliability:** diagnosis is consistent across different doctors
- **Validity:** diagnostic category needs to accurately capture the essential features of the various disorders
- Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) is the most commonly used North American classification system
    - Information presented in five axis
        - Axis I: primary diagnosis represents the person's primary clinical symptoms
        - Axis II: long standing personality or developmental disorders
        - Axis III: Physical conditions can could be relevant such as high blood pressure
        - Axis IV: Intensity of environmental stressors
        - Axis V: A person's ability to cope with stressors

Critical Issues in Diagnostic Labelling

Social and Personal Implications

- When a diagnostic label is put on someone, it becomes easy to accept the diagnosis as a description of the person and not the behavior
- Diagnostic labels may cause a worsening of psychological disorders
    - People may accept the new identity applied to them
    - Lowers morale and self esteem
    - May cause a self fulfilling prophecy

Legal Consequences

- Psychiatric diagnosis can commit individuals to mental institutions or lose certain civil rights
- **Competency:** defendant's state of mind at time of judicial hearing
    - If a person is not competent to stand trial, he is institutionalized until judged competent
- **Insanity:** state of mind when a crime was committed
    - A person may be declared not guilty by reason of insanity if they lacked the capacity to appreciate the wrongfulness of their acts

Anxiety Disorders

- **Anxiety disorder:** when frequency and intensity of anxiety is out of proportions to the situation that triggered them
- Four components
    1. Subjective emotional: feelings of tension and apprehension
    2. Cognitive: feelings of apprehension, sense of impending danger, feeling of inability to cope
    3. Physiological: increase heart rate and blood pressure, muscle tension, rapid breathing
    4. Behavioral: avoidance of certain situations and impaired task performance
- Most prevalent disorder in North America, affecting 17.6% of pop. In their lifetime

Phobic Disorder

- **Phobias** are strong and irrational fears of a certain object or situation
  - Disproportional to the stimuli
- Most common in North America
  - **Agoraphobia:** fear of open and public spaces
  - **Social Phobia:** fear of situations in which one can be evaluated and embarrassed
  - **Specific Phobia:** eg. Needles, dogs, etc
- Degree of impairment depends on how often the stimuli is encountered
  - Eg. If you fly all the time, fear of flying is very debilitating

Generalized Anxiety Disorder

- **Generalized anxiety disorder:** a chronic state of diffuse anxiety not attached to specific objects of situations
- May last for months with continuous symptoms
- Physiological arousal (diarrhea, sweating) and emotional tenseness
- 5% of people between 15 and 45 report having symptoms of general anxiety disorder

Panic Disorder

- **Panic disorders** occur suddenly and unpredictably and are much more intense
- Occur out of the blue without any identifiable stimulus
- People with panic attacks may develop **agoraphobia,** fear of public places
- Appear in late adolescence or early adulthood
- 34% of Canadian students have experience panic attacks in the previous year in periods of extreme stress
  - Not diagnosed as having the disease unless they develop an inordinate fear of having future attacks

Obsessive-Compulsive Disorder (OCD)

- **Obsessive-compulsive disorder** composed of a cognitive and a behavioral component
- **Obsessions:** repetitive and unwelcome thoughts, images, or impulses that invade consciousness
- **Compulsions:** repetitive behavioral response that can be resisted only with great difficulty
- Eg. Afraid of contamination, and resort to continuous cleaning
- Once the compulsion was performed, anxiety is reduced until it invades again
- Compulsions reduce anxiety and is strengthened through a process of negative reinforcement

Causal Factors in Anxiety Disorders

Biological Factors

- Genetic factors create a vulnerability to anxiety disorders
  - Autonomic nervous system can overreact to perceived threat, creating high physiological arousal
  - Overactivity in the right hemisphere can cause PTSD
- Heritability attribute to 50 to 60 percent of anxiety scores and 40 to 50 percent attributed to individual's life experiences
- GABA is an inhibitory transmitter that reduces neural activity in the amygdala and other brain structures that stimulate physiological arousal
  - Low GABA can cause highly reactive nervous systems that quickly produce anxiety response
  - Patients with a history of panic attacks showed 22% lower concentration of GABA
- Women are more susceptible for anxiety disorders

- **Biological preparedness** make it easier for us to learn to fear certain stimuli

Psychological Factors

Psychodynamic Theories

- **Neurotic anxiety** occurs when unacceptable impulses threaten to overwhelm the ego's defences and explode into action
    - How the ego's defense mechanism deals with it determines the form of the anxiety disorder
- Compulsion is a way of undoing one's unacceptable urges
    - Handwashing may be used to deal with one's dirty sexual impulses
- General anxiety occurs when one's defenses are not strong enough to control or contain anxiety, but are strong enough to hide the underlying conflict

Cognitive Factors

- People with anxiety disorder tend to magnify environmental demands into threats
    - When asked social phobics how likely they would embarrass themselves in a social situation and the costs of being embarrassed, they judged both the likelihood and the consequences higher than nonphobic people
- Panic disorder occur as an exaggerated misinterpretation of normal anxiety symptoms such as heart palpitations, dizziness, and breathlessness
    - They appraise these as a sign of a heart attack or a psychological loss of control will happen

Anxiety as a learned response

- Anxiety is a result from emotional conditioning
    - Eg. People develop a fear of high places after falling from them
- Can also be acquired through observational learning
    - Eg. Televised air plane crashes
    - However, does not explain all cases: indicates a biological predisposition
- Can be triggered by environmental and internal cues
    - In phobias, it tends to be the feared stimulus
    - In panic attacks, it's usually internal cues such as bodily sensation or mental images
- Compulsions such as avoidance of public places or phobic avoidance creates negative reinforcement

Sociocultural Factors

- **Culture bound disorders** only occur in certain places
    - Koro is a Southeast Asian anxiety where a man fears his penis is going to retract into his abdomen and kill him
    - Taijin Kyofushu (Japan): pathologically fearful of offending others by emitting offensive odors, blushing, staring inappropriately, or having an improper facial expression
    - Windigo (North American Indians): fear of being possessed by monsters and be turned into cannibals
    - Anorexia Nervosa: fear of getting fat and found exclusively in developed nations

Eating Disorders

- **Anorexia Nervosa** have an intense fear of getting fat and severely restrict food intake to a point of starvation
    - View themselves as fat despite being skinny
    - Mostly adolescent women
    - Bone loss, heart strain, mentrauation stops
- **Bulimia Nervosa:** fear of being fat, but instead of starvation, they binge eat and then purge the food by using laxatives or vomiting

    - Have normal weight
    - Purging can cause eording teeth and gastric problems

Causes of Anorexia and Bulimia

- Western cultures view thinness as beauty and view the body as an object

Anorexia

    - Anorexics are often perfectionists that set high standards for themselves
    - Losing weight becomes a battle for success and control
        - Me versus food
        - Usually have disapproving parents with high standards

Bulimia

    - Low impulse control
    - Lack a stable sense of personal identity and self sufficiency
    - Binging triggered by life stress and followed by guilt and self contempt

- Some genetic factors, higher concordance among identical twins
- Physiological changes are a response to abnormal eating patterns, and they perpetuate eating and digestive irregularities
    - Eg. When anorexics begin to eat, their leptin rebounds which reduces their appetite, making it difficult to gain weight
    - Eg. When bulimics throw up, they destroy taste buds, which makes the taste of acid more tolerable

Mood (Affective) Disorders

Depression

- Almost everyone has experience depression
- 25 to 30% of university students are experiencing mild depression
    - Usually goes away as people get over their situation
- Clinical depression is when the symptoms are disproportional to the person's life
- A small set back can cause **major depression** that leaves them unable to function effectively in their lives
- Others experience **dysthymia** that has less dramatic effects on personal and occupational functioning
    - Chronic and long lasting form of misery
- 3 types of symptoms:
    - Cognitive, motivational, and somatic

Negative Mood state

- Core feature of depression
- Feeling of sadness, misery, and loneliness
- Lose ability to experience pleasure

Cognitive Symptoms

- Difficulty concentrating and making decisions
- Low self esteem
- When setbacks occur, they blame themselves
- Believing that things will fail in the future because of them

Motivational Symptoms

- Inability to produce behavior that brings pleasure or accomplishment
- Everything seems too much of an effort

Somatic Symptoms

- Loss of appetite and weight loss in moderate and severe depression
- Sleep disturbances, particularly insomnia
- May lose sexual desire

Bipolar Disorder

- Depression (usually dominant) alternates with periods of **mania** (state of highly excited mood and behavior)
- In manic state, a person believes there is no limit to what he can do
- Manics go for days without sleep until exhaustion finally sets in

Prevalence and Course of Mood Disorders

- 1/20 North Americans are severely depressed
- 1/5 will have a depression episode in life
- No age group is exempt from depression
- Depression on the increase in the 15 to 19 year old group
- People born after 1960 are 10 times more likely to suffer from depression
- Depression is similar across socio-economic and ethnic groups
- Women are more likely to suffer from unipolar depression; no difference in bipolar
    - Biological causes; premenstrual depression could increase likely hood of depressive disorders
    - Socio-cultural factors: women are more likely to be passive and dependent in the face of stress where as men are more likely to distract themselves through activities such as physical activity or drinking
- Most depressive people never seek treatment
    - However, usually dissipates over time
    - Lasts 5 to 10 months untreated
- In half of the cases, depression will never recur
- Others will have another recurrence after an average of three years
- 10% will never recover and will remain chronically depressed

Causal Factors in Mood Disorders

Biological Factors

- 67% concordance in identical twins for depression vs 15% for fraternal
- Predisposition to develop a depressive disorder tends to be inherited
- Brain chemistry: underactivity in norepinephrine, dopamine, and serotonin
    - Results in lack of pleasure and loss of motivation
    - Drugs that stimulate these centers gave depressed individuals pleasure
- 50% of people with bipolar disorder has a family member with the same disease
    - Strong biological connections
- Mania stems from overproduction of the same neurotransmitters that cause depression
    - Lithium chloride is used to calm people with manic disorders

Psychological Factors

Personality based vulnerability

- Early traumatic losses or rejection creates vulnerability for later depression by triggering a grieving and rage process that becomes of the individual's personality
    - Later loss reactivates the original loss and causes reaction from that event as well
- Rate of depression for women who lost their mothers before age 11 and experienced a recent loss was 3x more than women who experienced recent loss alone
- Humanistic perspective claims that the reason depression has increased for people born after the 1960 is because they are becoming more "me" focused
    - They stray away from family, religion, and the common good
    - Failures are taken more personally and view them as their own inadequacies

Cognitive Process

- Depressed people victimize themselves through their own beliefs that they are defective, worthless, and inadequate
- **Depressive cognitive triad** has negative thoughts about
    1. The world
    2. Oneself
    3. The future
- Depressed people think about failure more than success
- Their thinking trigger the depressed effect
- **Depressive attributional pattern:** taking no credit for success and blaming oneself for failure
- **Learned helplessness theory:** depression occurs when people anticipate a bad event and there is nothing they can do to prevent or cope with it
    - People who attribute bad events to factors such as low intelligence, physical repulsiveness, or an unlovable personality tend to believe that their personal defects will render them helpless to avoid future negative events

Learning and Environmental Factors

- Depression triggered by loss or punishment or a drastic decrease in the amount of positive reinforcement received from the environment
- Depressed people make their contacts depressed, anxious and hostile
    - This further diminishes social support
- Depressed people should force behavior that produce some degree of pleasure
    - This positive reinforcement will counteract the depressive effect
- May explain family concordance in depression
    - Children of depressed parents may experience stress as they grow up

Sociocultural Factors

- Prevalence of depression is far low in Hong Kong and Taiwan, where strong connections to family and other groups reduce the negative impact of loss and disappointment
- Guilt and personal inadequacy predominate in North America and western European countries where somatic symptoms are more common in Latin, Chinese, and African cultures
- No sex differences found in developing nations whereas women are twice as likely to be depressed in technologically advanced nations

Somatoform Disorders

- **Somatoform disorders** involve physical complaints or disabilities with no biological causes
- **Hypochondriasis:** people become unduly alarmed about any physical symptoms they detect and are convinced they have a serious ailment
- **Pain disorder:** experience intense pain disproportional to their ailment or with no pain source at all
- **Conversion disorder:** neurological symptoms such as paralysis cause a loss of sensation, paralysis, or blindness to suddenly occur
    - They often exhibit **la belle indifference:** a lack of concern about their symptoms and its implications
    - *Glove anaesthesia:* loss of feeling in the hand; physiologically impossible because nerves run down the arm
    - Rare; 3 in 1000 North Americans in peace time but more frequent in wartime
- Psychogenic blindness is rare in the general population
    - Cambodian refugees settled in Long Beach

        - Survivors of the killing fields of Cambodia were subject to unspeakable horror
        - Their eyes and visual cortex are registering patterns, but they cannot see
    - Freud: underlying conflict creates so much anxiety that the ego kept the conflict out of consciousness by creating a physical symptom that symbolized the conflict
- Somatoform disorders tend to run in families
- More common in cultures that discourage open discussion of emotion or that stigmatize psychological disorders

Dissociative Disorders

- **Dissociative disorders** involve a breakdown of the normal unity and coherence of the many facets of self and results in alterations in memory or identity
- **Psychogenic amnesia:** person responds to stressful even with extensive but selective memory loss
- **Psychogenic fugue:** person loses all sense of personal identity, gives up his or her customary life, wanders to a faraway location, and establishes a new identity
    - Usually triggered by a stressful or traumatic event
    - People in fugue suddenly recovers their original identity and wake up mystified and distressed at being in a strange circumstance
- **Dissociative Identity disorder (DID)** (Multiple personality disorder): two or more separate personalities coexist in the same person
    - Primary (host) personality occurs more than others (alters)
    - Has its own integrated memories and behaviors
    - Personalities may or may not know the existence of others
    - Can differ in age and gender
- The **trauma dissociation theory** is the development of new personalities in response to severe stress
    - In a study 97 of 100 with DID had suffered severe abuse or trauma in early or middle childhood
    - The new identity allows them to detach from the trauma and transfer it to someone who can handle it

Schizophrenia

- **Schizophrenia** is a psychotic disorder that involves severe disturbances in thinking, speech, perception, emotion, and behavior
    - Literally means "split mid"

Characteristics of Schizophrenia

- A person misinterprets reality and exhibits disordered attention, thought, or perception
- Sometimes include **delusion:** false beliefs that are sustained in the face of evidence that would be normally sufficient to destroy them
- Some experience **hallucinations**
    - Auditory is the most common, although visual and tactile may occur
- Many people with schizophrenia have *blunted affect*, manifesting less sadness, joy and anger
- Others have *Flat Affect*, showing almost no emotions
- Some can have *inappropriate affect*: reacting with the wrong emotions
    - Crying during a comedy, smiling when in pain

Subtypes of Schizophrenia

4 major types

1. **Paranoid type:** have delusions of persecution; other mean harm to them. Can also have delusions of grandeur, believing they are enormously important.
2. **Disorganized type:** confusion and incoherence with deterioration of adaptive behavior; emotionally unstable and are extremely disorganized in cognition
3. **Catatonic Type:** motor disturbances from muscular rigidity and random or repetitive movements; While in a stuporous state they may exhibit waxy flexibility in which their limbs can be moulded by another person that will hold for hours
4. **Undifferentiated type:** experience a selection of symptoms that are not any specific type

- 2 basic classes of symptoms
- **Type I schizophrenia:** characterized by a predominance of positive symptoms such as delusions, hallucinations, and disordered speech and thinking
    - Positive symptoms are extreme normal processes
- **Type II schizophrenia:** negative symptom (an absence of normal reactions) such as lack of emotional expression, loss of motivation, and an absence of normal speech
- Schizophrenia affects only 1 to 2 percent of the population
- 10% are permanently impaired, 65 percent show intermittent periods of intermittent periods of normal functioning, the other 25 percent recover from the disorder
    - Affects males more than females

Causal Factors in Schizophrenia

Biological Factors

- Some heritability factors
- Genetics do not account for the development of schizophrenia
- Schizophrenia has different brain structures
    - 20 to 35 percent show mild to moderate brain atrophy, the loss or deterioration of neurons in the cerebral cortex and limbic system
    - Abnormal thalamus, which collects and routes sensory input to various locations may explain thought disorders and inappropriate emotion
- **Dopamine hypothesis** states that the symptoms of schizophrenia are produced by over activity of the dopamine system in areas of the brain that regulate emotional expression

Psychological Factors

- Psychoanalytic thinkers view schizophrenia as a retreat from unbearable stress and conflict
    - A defense mechanism of **regression**, in which a person retreats to an earlier and more secure stage of psychosocial development in face of overwhelming anxiety
- Cognitive theorists believe that schizophrenics have a defect in the attentional mechanism that filter out irrelevant stimuli
    - They are overwhelmed by both internal and external stimuli
        - This produces distractability, thought disorganization, and a sense of being overwhelmed by disconnected thoughts and ideas
    - Prefrontal cortex helps us distinguish reality from fantasy and this area is inactive during schizophrenic hallucinations

Environmental Factors

- Stressful events tend to occur 2 to 3 weeks preceding the disorder
- Children of normal parents raised by schizophrenic adoptive parents do not have

increase risk of schizophrenia
    - Shows that biological vulnerability factors must be present if stressful familial events are to cause their damage
- Previously hospitalize schizophrenics are more likely to relapse when they return to a home environment where there is a high **expressed emotion** which include: high levels of criticism, hostility, and overinvolvement

Sociocultural Factors

- Schizophrenia is highest in lower socio-economic populations
- **Social causation hypothesis** attributes the higher prevalence of schizophrenia to the higher levels of stress that lower income people experience
- **Social drift hypothesis** proposes that the deterioration of personal and occupational functioning causes a drift down the socio-economic ladder
- Schizophrenia prevalence is even distributed across the world
    - Recovery is more likely in developing than developed countries

Personality Disorders

- **Personality disorder:** exhibit stable, ingrained, inflexible, and maladaptive ways of thinking, feeling and behaving

Anti-social Personality Disorder

- Males outnumber females three to one
- People with antisocial disorder seem to lack a conscience
    - Exhibit little anxiety or guilt and tend to be impulsive and unable to delay gratification of their needs
    - Lack attachment to others
- Lack of capacity to care about others make anti social individuals a danger to society
- They appear to be intelligent and charming and have a way to rationalize their inappropriate behavior so it appears reasonable and justifiable
- Anti social people fail to respond to punishment
- To be diagnosed, one has to be 18 years of age and require substantial anti social behavior before the age of 15 including habitual lying, early and aggressive sexual behavior, excessive drinking, theft, vandalism, and chronic rule violation

Causal Factors

Biological Factors

- Higher concordance among identical than fraternal twins
- Physiological basis for disorder may lie in some dysfunction in the brain structures control emotional arousal and behavioral inhibition
    - May be constantly underaroused which causes search for excitement

Psychological and Environmental Factors

- Psychodynamic theorists regard anti social personalities as people without a conscience
    - Did not develop an adequate superego
    - Constraints on the id are reduced, resulting in impulsive and hedonistic behavior
- People with criminal records show much poorer emotional conditioning than those with no criminal record
- Many anti social people come from homes in which parents exhibit a good deal of aggression and inattentive to their children's needs
- They consistently fail to think about long term negative consequences of their actions and act impulsively

Disorders of Childhood and Old Age

Childhood Disorders

- It is often more difficult to diagnose because of uncertainty of whether deviant behavior is caused by lack of emotional maturity
- Psychological disorders are common in children between infancy and age 17
- Only 40% with disorders receive medical attention

Externalizing Disorders

- Directed toward the environment in the form of behaviors that are disruptive and aggressive
- **Attention-deficit/hyperactivity disorder (ADHD):** attentional difficulties, hyperactivity-impulsivity, and causes impaired learning function
    - 7 to 10 percent meet criteria for this disorder
    - 4 times more frequent in boys than girls
    - 50 to 80 percent of the time, it grows into adolescence
    - 30 to 50% into adulthood
    - Some genetic concordance
- **Oppositional defiant disorder:** behave in a disobedient, defiant, and hostile manner that interfere with the child's functioning and interpersonal relationships
    - Does not differ between boys and girls
    - ODD leads to a more severe **conduct disorder,** in which people violate important social norms and show disregard for the rights of others

Internalizing Disorders

- Involve maladaptive thoughts and emotions that are no disruptive to others
- Take a toll on self esteem and self efficacy and interfere with the development of effective coping and interpersonal skills
- May be due to a genetically caused deficit in emotional regulation, the development of thinking styles that foster anxiety or depression

Dementia in Old Age

- **Dementia:** the gradual loss of cognitive abilities that accompanies brain deterioration and interferes with normal functioning
    - Most common types include Alzheimer's Parkinson's Huntington's
- When dementia is diagnosed past age 65, it is labeled senile dementia
- 8% senile dementia rate, with female-to-male 2 to 1
- Gradual appearance of symptoms including memory impairment, poor judgment, confusion, language problems, and disorientation
- **Alzheimer's disease** is the leading cause of dementia in the elderly, accounting for 60% of the senile dementias
    - Deterioration of the frontal and temporal lobes of the brain
    - Destruction of cells that produce acetylcholine, a neurotransmitter critical in the neural processes underlying memory

Chapter 14 Notes

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The Helping Relationship

- A good relationship between patient and therapist is a prime ingredient of therapeutic success
- Majority of people with mental health issues seek help from family and friends before therapists
    - Sometimes not enough, 30% will seek professional help in their lifetime
- Counselling and clinical psychologists hold Ph.D. and Psy. D degrees
- Psychiatrists are specialized in biomedical treatments such as drug therapy
- Others include psychiatric social workers, marriage and family counsellors, pastoral counsellors, and abuse counsellors
    - Usually have a masters degree

Psychodynamic Therapies

Psychoanalysis

- Help clients achieve **insight**, awareness of the psychodynamics that underlie their problems
- With knowledge, the psychic energy previously used to keeping unconscious conflicts under control in a maladaptive manner, can be redirected to more adaptive ways of living

Free Association

- Asked to describe any thoughts, feelings, or images that entered the awareness
- Believes that mental events meaningfully associate one with another
- Does not necessarily lead to unconscious material
    - Eg. If a person's flow of information stops after talking about their father, it may be that the topic was loaded and activated the repressive defenses

Dream Interpretation

- Dreams are the royal road to the unconscious
- Tries to understand the unconscious material contained in dreams and arrive at an understanding of what the symbols in the dream really represent

Resistance

- Defensive manoeuvres that hinder the process of therapy
- This is due to the fact that the ego tries to repress certain unconscious conflicts because they are extremely painful
- Can come from difficulty in free association, or forgetting a therapy appointment, or avoiding certain topics
    - Sign that the anxiety arousing material is being approached

Transference

- **Transference** occurs when the client responds irrationally to the analyst as if he or she were an important figure from the client's past
    - **Positive transference:** client transfers feelings of intense affection, dependency, or love to the analyst
    - **Negative transference:** irrational expressions of anger, hatred, or disappointment

Interpretation

- A general rule for interpretation is to interpret what is already near the surface and

just beyond the client's current awareness
- Deep interpretations, even if correct, are not useful because they are so far removed from the client's consciousness that they cannot be informative or helpful

Brief Psychodynamic Therapies

- Very time consuming and requires to see the patient many times per week
  - Diminishing returns
- Uses the basic concept of psychoanalysis
- More focused on current issues than the past
- **Interpersonal therapy** deals with interpersonal problems such as marital conflict, adjusting to a loss or change of a relationship, and identifying and correcting deficits in social skills

Humanistic Psychotherapies

- View humans as consciously able to control their choices and behavior
- People have inner resources for healing and growth
- Therapist's goal is to create an environment to which the patient can self explore and remove the barriers that block their natural tendencies to self growth
- Focused on the present and the future

Client Centered Therapy

- Developed by Carl Rogers
  - Focused on the therapist-patient relationship and interested in creating an environment best for self exploration and personal growth

1. **Unconditional Positive Regard**
   - Therapists showing clients that they genuinely care about and accept them
   - Creates a sense of trust
2. **Empathy**
   - Willingness and ability to view the world through the client's eyes
   - Therapist reflects back on what the client is saying
3. **Genuineness**
   - Must be able to express feelings honestly even if they are negative
   - Still accepts them as a person (condition 1), even though they may not accept their actions

- In these conditions, the client will feel accepted, understood and free to explore basic attitudes and feelings without fear of being judged or rejected
- A constructive therapeutical relationship causes the client to exhibit increased self acceptance, greater self awareness, enhanced self reliance, increased comfort with other relationships, and improved life functioning

Gestalt Therapy

- Pioneered by Frederick S. Perls
- When we perceive something, we only concentrate on a part of our experience and not the whole thing
- For people with mental issues, they will keep anxiety cause issues out of their mind
- They try to get the clients to get in touch with their inner selves
- **Empty chair technique:** client imagines talking to someone in an empty chair and tries to role both himself and the other person
  - Brings out powerful unresolved issues that affect their relationship
- Greenberg and Malcolm showed that Gestalt therapy to be helpful
  - 13 of 32 clients completely resolved their unfinished business and had better treatment outcomes

Cognitive Therapies

- Focus on the role of irrational and self defeating thought patterns

Ellis's Rational-Emotive Therapy

ABCD Model

A. *Activating event* that seems to trigger the emotion
B. *Belief system* that underlies the way in which a person appraises the event
C. Emotional behavioral *consequences* of the appraisal
D. Changing maladaptive emotions and behaviors: *disputing*, or challenging, an erroneous belief system

- People are accustomed to viewing their emotions as being directly caused by events
    - However, this is not true, as it depends on their belief system
    - If a young man feels depressed after being rejected by a woman, it is his belief that he must be loved by others, especially those he thinks are important
- Rational-emotive therapists introduce clients to common irrational ideas and then train them to ferret out the particular ideas that underlie their maladaptive emotional responses

Beck's Cognitive Therapy

- Identifies errors in thinking and logic and help clients identify and reprogram their overlearned "automatic" thought patterns
- This treatment has been extended to the treatment of anger and anxiety disorders

Behavior Therapies

- Insist that (1) behavior disorders are learned in the same ways normal behaviors are, and (2) these maladaptive behaviors can be unlearned by application of principles derived from research on classical conditioning and operant conditioning

Classical Conditioning Treatments

- Used to reduce, or decondition, anxiety responses
- Used in attempts to condition new anxiety responses to a particular class of stimuli, such as alcoholic beverages or inappropriate sexual objects

Exposure: An Extinction Approach

- The best way to reduce fear is through a process of classical extinction of the anxiety response
    - Involves exposure to the feared CS in the absence of the UCS while using **response prevention** to keep operant avoidance response from occurring
- May be exposed to real life stimuli, known as **flooding**
- May be asked to imagine scenes involving the stimuli, known as **implosion therapy**
- Anxiety will extinguish in time if the person remains in the presence of the CS and the UCS does not occur
- Before treatment, agoraphobics can only perform 27 percent of tasks in public and 71% was able to do it afterwards
    - This degree of improvement was maintained or increased in follow ups
- OCD patients benefited from this treatment was well

Systematic Desensitization: A Counterconditioning Approach

- **Systematic desensitization:** Uses a technique known as **counterconditioning** in which a new response that is incompatible with anxiety is conditioned to the anxiety arousing CS
- First step is to train the patient in voluntary muscle relaxation

- Next a **stimulus hierarchy** is created in order of increasing anxiety
- The therapist asks the client to imagine the scene in order
- Client can't be relaxed and anxious at the same time, so if the relaxation is strong enough, it replaces anxiety as the CR to that stimulus
    - When the scene can be imagined for a long time without anxiety, therapist moves to the next scene
- Can also be done with exposure to a hierarchy of real stimuli known as **in vivo desensitization**
- Systematic desensitization is preferred over extinction because the experience will be far less anxiety inducing
    - However, exposure reduces anxiety faster than systematic desensitization

Aversion Therapy

- Therapist pairs a stimulus that is attractive to a person and causes self defeating behavior with a noxious UCS to condition an aversion to CS
    - Eg. Injecting client with a nausea inducing drug then have them drink alcohol
- Aversion therapy has been effective in treating alcoholism, with 63% still abstinent after a year and 33% abstinent after 3 years

Operant Conditioning Treatments

- **Behavior modification** refers to treatment techniques that involve the application of operant conditioning techniques in attempt to increase or decrease a specific behavior
- Uses positive reinforcement, extinction, negative reinforcement, or punishment
- Yields successful results when dealing with populations that are difficult to treat with more traditional therapies

Positive Reinforcement

- The **token economy** is a system for strengthening desired behaviors such as personal grooming, appropriate social responses, housekeeping behavior, working on assigned jobs, and participating in vocational training programs
    - Used in hospitals
- Plastic tokens are given for good behavior
- Tokens can be redeemed for tangible reinforcers such as private rooms TV, furniture, etc.
- The goal is to reach a point where social and self reinforcers will take over and maintain them outside the hospital
    - When this begins to occur, tokens can be phased out and the desired behavior will continue to occur
- Highly effective in treating schizophrenic patients

Therapeutic Use of Punishment

- Two questions need to be asked
    - Are there alternative, less painful approaches that might be effective
    - Is the behavior to be eliminated sufficiently injurious to the individual or to society to justify the severity of the punishment
- Some severely disturbed autistic children bang their head against the wall and hit themselves
    - Electric shock punishment is used to eliminate these behaviors

Modelling and Social Skills Training

- In **social skills training**, clients learn new skills by observing and then imitating a model who performs a socially skillful model
    - Usually used on university students who have great difficulty asking women for

dates
- Social skills training has been used with many populations including individuals who have minor deficits in social skills

Integrating and Combining Therapies

- Clinicians are becoming **eclectic**, combining treatments and making use of whatever orientations and therapeutic techniques seem appropriate for the particular client
- Many therapists now label themselves *cognitive behavioral therapists* because they use both perspectives
- Some methods work better for certain illnesses
    - Eg. Gestalt is effective in discovering underlying feelings
- In a recent survey of eclectic therapists, 72 percent used psychodynamic principles, 54 percent used cognitive approaches, 45 percent used behavioral techniques
- **Psychodynamic behavior therapy**
    - Eg. A man who is angry because he is unassertive. He may be treated with psychoanalysis to improve see his unassertiveness as a the source of his anger. At this point, psychoanalysis has reached it limit, and behavior skills such as modelling is used to help develop assertive skills.

Cultural and Gender Issues in Psychotherapy

Cultural Factors in Treatment Utilization

- Overall rates of psychopathology do no differ greatly between ethnic groups
- Utilization of mental health services is far less for minority groups than for its white majority
- Diversity creates certain barriers
    - Tendency for people not to seek professional help outside of their cultural norm
    - Language barriers
    - History of frustrating experiences with White bureaucracy
    - Too few therapists that can provide culturally responsive forms of treatment
- How to overcome these barriers
    - Bring the mental health service agencies in minority dwelling areas
    - Train more therapists from these cultural groups
- **Culturally competent** therapists are able to use knowledge about the client's culture to achieve a broad understanding of the client
    - They can introduce cultural specific elements into therapy
- Current therapists' therapy is more effective when they exposed to culturally sensitive training

Gender Issues in Therapy

- Men an women live different lives
- In western cultures, women suffer from depression and anxiety disorders
    - May be due to lack of opportunity due to sexism, overrepresented poverty rate, subjection to double burden days
- Therapists focus on what can be done to change women's life circumstances and help them adapt to sex role expectations that constrain them
    - It is important for both men and women to support people in making choices that meet their need

Evaluating Psychotherapies

- **Specificity question:** "which types of therapy, administered by which kids of

therapists to which kinds of clients having which kinds of problems, produce which kind of effects."

Psychotherapy Research Methods

- In the 1930s and 40s, case studies were most widely used
  - Freud and other psychoanalysts rejected using experimental methods and state that many people who have undergone treatment had improved mental health
- Eysenck used insurance data on people who applied for disability due to psychological problems
  - Concluded that the rate of **spontaneous remission:** symptom reduction in absence of treatment was as high as the success rate reported by psychotherapy
  - Also concluded that data gathered by therapists could be biased because they want to see themselves as competent and successful
  - Now it seems that Eysenck's conclusions were overly pessimistic
  - Triggered new research and other forms of therapy
- The American Psychological Association's Division of Clinical Psychology identifies **empirically validated therapies** that shows to be effective

What is a Good Psychotherapy Research Design?

- Most psychotherapy researchers favor **randomized clinical trials** involving patients with well defined disorders that are similar to each other
  - Placed in different forms of therapy
  - Some are placed in a **placebo control group** where the methods used are expected to fail
  - Tests to see which forms of therapy is valid for a certain mental disorder
- APA makes a standarized manual that contains procedures that must be followed exactly
- Researchers should collect follow up data
  - Shows that the effects are lasting and that the patients do not relapse

Meta-Analysis: A Look at the Big Picture

- **Meta-analysis** allows researchers to combine results of different studies to arrive at an overall conclusion
- They can compute an **effect size statistic** that represents a common measure of treatment effectiveness
  - Shows which percentage of clients who received treatment had more favorable outcomes that those who did not
- Smith and Glass showed that those who received therapy had more than 75% more favorable outcomes than untreated cases
- Psychodynamic, client centered, and behavioral methods yield similar results while Gestalt was the least effective
- The different treatments were given the **dodo bird verdict**: Everyone has won and all must have prizes
  - Other challenge that it may mask **differential effectiveness**, some specific therapies are more effective for certain disorders than others
- How does therapeutic success define?
  - **Clinical significance** would require that clients' depression scores fall within the range for nondepressed people
  - More stringent definition = lower success rate
- When rigorous therapies are compared with less rigorous ones, the outcomes may be skewed
  - Rigorous ones usually have more favorable outcomes

Factors Affecting the Outcome of Therapy

- 10 percent of people get worse as a result o therapy
- Client variables
    1. **Openness:** clients' general willingness to invest themselves in therapy and take the risks required to change themselves
    2. **Self-relatedness:** client's ability to experience and understand internal states such as thoughts and emotions to be attuned to the processes that go on in their relationship with their therapist
    3. Nature of the problem and its ability to fit with the treatment with the therapy used
- Quality of the relationship between therapist and client
    - Must be in an empathic, trusting, and caring relationship
    - Hostile relationships can cause a **deterioration effect** where the client gets worse
- Therapist ability
    - Most effective therapists adjusted their techniques to specific needs of their clients
    - To be effective, the client must be in therapy for a while
    - **Dose-response effect:** the relationship between the amount of treatment received and the quality of the outcome
        - 58 to 67 percent of clients improved clinically after an average of 13 sessions
- **Common factors** shared by different forms of therapy that contribute to their success
    - Faith in the therapist and believing that the help they receive is useful
    - Plausible explanation of their problems
    - Protective setting in which clients can experience and express their deepest feelings within a supportive relationship
    - An opportunity to practise new behaviors
    - Increased optimism and self efficacy

Biological Approaches to Treatment

Drug Therapies

- More than 200 million prescription are filled for psychological disorders

Anti-anxiety Drugs

- More than 15% of Americans between 18 and 74 use anti anxiety/tranquilizing drugs such as Valium, Xanax, and BuSpar
- Designed to reduce anxiety without affecting alertness or concentration
- A temporary relief from anxiety may allow a client to enter anxiety arousing situations and learn to cope with them more effectively
- People develop physiological dependence on tranquilizers and may experience withdrawal symptoms such as intense anxiety, nausea and restlessness
- Buspirone (BuSpar) is slow acting, has fewer fatiguing side effects, and has less potential for abuse
    - Effective in PTSD and general anxiety
    - Reduces excitatory synaptic activity by the excitement of GABA, which reduces neural activity in areas of the brain associated with emotional arousal

Antidepressant Drugs

- 3 categories: tricyclics (Elavil, Tofranil), monoamine oxidase (MAO) inhibitors (Nardil, Parnate), Selective reuptake inhibitors (SSRI) (Prozac, Zoloft, Paxil)
- First two classes increase the activity of the excitatory neurotransmitters norepinephrine and serotonin

    - Tricyclics prevent the reuptake of excitatory transmitters into the presynaptic neurons
    - MAO inhibitors reduce the activity of monoamine oxidase which breaks down neurotransmitters at the synapse
- MAO inhibitors have more severe side effects than tricyclics and can cause a dangerous elevation in blood pressure when taken with certain foods
- SSRIs are designed to decrease side effects by increasing the activity of only serotonin
    - Can cause nervousness, insomnia, sweating, join pain, or sexual dysfunction
    - Works by blocking reuptake of serotonin

Antipsychotic Drugs

- Drugs have allowed for a decrease in the number of people hospitalized and allowed them to function in the wild
- Accidental discovery of reserpine, a drug from the root of the snakeroot plant, calmed psychotic patients
    - Led to the development of major tranquilizers which is used to decrease the action of dopamine, the neurotransmitter whose overactivity is thought to be involved in schizophrenia
        - Works well on positive symptoms such as delusion and hallucination, but little effect on negative symptoms such as apathy and withdrawal
        - Schizophrenics tend to relapse if they stop taking the drugs
- These drugs can cause a movement disorder known as **tardive dyskinesia,** grotesque movements of the face and tongue and sometimes limbs flailing uncontrollably
    - 18.5% of young adults and 31% of those over 55 develop tardive dyskenesia symptoms
- New drug clozapine (Clozaril) reduces both the positive and negative symptoms and odes not seem to produce tardive dyskenesia
    - Produces a fatal blood disease in 1 to 2 percent of the people taking it
- Antipsychotic drugs can often be used in conjunction with psychotherapy

Electroconvulsive Therapy

- **ECT** originated from the observation that schizophrenia and epilepsy rarely occurred in the same person
    - Figured that seizure induction might be helpful in the treatment of schizophrenia
    - Recent research shows that it cannot relieve anxiety disorders and it is of questionable value for schizophrenic patients
    - Useful in treating depression especially if there is a high risk of suicide
        - Drugs in this case is impractical because they take too long to have an effect
- Roughly 100 volts
- Convulsions can be so severe that they may injure themselves
- 60 to 70 percent improvement
- Critics point out that the possibility of a depressive relapse is high
- Possibility of permanent memory loss and permanent brain damage

Psychosurgery

- Surgical procedures that remove or destroy brain tissue to change disordered behavior
- In the 1930s, Moniz reported that cutting the connection between the frontal lobes with subcortical areas of the brain involved in emotion resulted in a calming psychotic and uncontrollably violent patients
    - Known as a lobotomy
    - Moniz received a nobel prize for his contribution

- Lobotomy caused severe side effects on mental and emotional functioning including seizures, stupor, memory and reasoning impairment, and listlessness
- More concise procedures are still used today for extreme cases
- **Cingulotomy** involves cutting a small fiber near the corpus callosum that connects the frontal lobes with the limbic system
    - Successful in treating severe depressive and OCD disorders that have failed to improve with drug treatment or psychotherapy

Mind, Body, and Therapeutic Interventions

- Biological and therapeutic treatments can be seen as different routes to the same destination
- In a study of people fearing social situations showed that both SSRI treatment and psychotherapy were effective
    - Psychological treatment produced a stronger reduction in fear and social phobia than did the drug treatment
    - PET scans showed approximately the same neural activity reduction for both cases
- Drugs do not teach clients the coping skills needed to cope with the problem without drugs and do not cure the disorder

Psychological Disorders and Society

- The move towards institutionalization was pioneered by Dorothy Dix who travelled throughout Canada and the US to promote the humane treatment of people with mental disorders
- By the 1900s, most provinces had institutions set up for the mentally insane
- Frequently understaffed and underfunded and did nothing more than provide custodial care

Deinstitutionalization

- In the 1960s, there were concerns about the inadequacies of mental hospitals and the ability of antipsychotic drugs that could normalize patients behavior resulted in a **deinstitutionalization** movement to transfer people into the community
- The movement to community treatment is good since it allows people to remain in their social and work environments with minimal disruption of their life
    - Requires availability of high quality mental health care in community clinics, halfway houses, shltered workshops, etc.
    - The lack of them combined with deinstitutionalization can lead to the **revolving door phenomenon** involving repeated rehospitalizations
- 40 to 45 percent of the Canadian homeless have been hospitalized for a mental disorder in the past three years

Preventive Mental Health

- People may become vulnerable to psychological disorders as a result of situational and personal factors
- **Situation-focused prevention** is directed a reducing or elimination the environmental causes of behavior disorders
    - Eg. Programs designed to enhance the functioning of families, reduce stress within organizations, provide better educational opportunities for children, and develop a sense of connection to other people and the community in general
- **Competency-focused prevention** is designed to increase personal resources and coping skills
    - EG. Strengthening resistance to stress, improving social skills, etc.
    - In PTSD treatment of rape victims, the treatment group had much less symptoms

than the control group

Chapter 15 Notes

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The Nature of Stress

- Stress can be viewed as a stimulus, as a response, and as an organism environment interaction
- **Stressors** are eliciting stimuli that place strong demands on us
- Stress has been viewed as a response
- The most comprehensive way to think about it is a person-situation interaction between the organism and the environment (fig. 15.1)
- **Stress** is a pattern of cognitive appraisals, physiological responses, and behavioral tendencies that occurs in response to a perceived imbalance between situational demands and the resources required to cope with them

Stressors

- They are a specific kind of eliciting stimuli that places physical or psychological demand on us that endanger our well being and requires us to adapt
- **Microstressors:** daily hassles from school, job, etc
- **Catastrophic events:** natural disasters, war, etc.
    - Happens to many people at once
- **Major Negative events:** victim of sexual abuse, death of a family member, career failure, etc.

Measuring Stressful Life Events

- Researchers devised **life event scales** to quantify the amount of stress that a person has experienced over a period of time
- Table 15.1
- Asks whether each event was a positive or a negative one, and whether it was a major event or a day to day event
- Earlier theorists define both positive and negative stress as stress, but only negative stress leads to negative health implications

The Stress Response

- 4 stages of stress appraisal
    1. Appraisal of the **demands** of the situation (primary appraisal)
    2. Appraisal of the **resources** available to cope with it (secondary appraisal)
    3. Judgments of what the **consequences** of the situation could be
    4. Appraisal of the **personal meaning**, what the outcome might imply
- Job interview example
- **Primary appraisal** of the situation as being either benign, neutral/irrelevant, or threatening in terms of its demand
- Ability to cope with the situation and the resources to deal with it including knowledge, verbal skills, social resources (people that gives emotional support), **(secondary appraisal)**
- **Potential consequences:** will you be able to pay your tuition if you don't get the job? How likely is it that you will fail?
    - Appraising the consequences of failing as very costly and very likely to occur increases the perceived stressfulness of the situation
- Psychological meaning of the consequences may relate to your basic beliefs about the world

    - If you place self worth based on your success in such situations, you may view yourself as a failure if you don't succeed
- Distortion and mistakes in any part of the appraisal process will cause an inappropriate level of stress response
    - Ie. Underestimating the amount of resources available
- As soon as we make appraisals, the body responds
    - Autonomic and somatic feedback can affect our appraisal of how stressful a situation is

Chronic Stress and the GAS

- The **general adaptation syndrome** is a physiological response pattern to strong and prolonged stressors
- 3 phases: alarm reaction, resistance, and exhaustion
- **Alarm action** occurs because of the sudden activation of the sympathetic nervous system and the release of stress hormones by the endocrine system
    - Increased heart rate and respiration, dilated pupils, slower digestion
    - Blood arrives at muscles
    - Cortisol is produced which increases blood sugars and suppresses the immune system
        - If you are injured, cortisol suppresses inflamation
    - Body is primed to act in a fight or flight fashion
    - Body has a natural tendency for homeostasis, parasympathetic nervous system will kick in which mutes some of the effect of the sympathetic nervous system
- **Resistance** is the continuation of the person's resources being depleted to deal with the stress
    - Blood sugar levels, suppression of digestion and immune system, and increase heart rate and respiration cannot last forever and eventually resistance comes to an end
- **Exhaustion** is when the body's resources are dangerously depleted
    - Increase vulnerability to disease, collapse and even death
    - The body's weakest system will be affected during the stage of exhaustion

Stress and Health

- The physical mobilization system sculpted by evolution to help organisms deal with life threatening physical stressors may not be as adaptive for dealing with psychological stressors of modern life

Stress and Psychological Well-Being

- In a study of natural disasters, Rubonis and Bickman found an average of 17% increase in rates of psychological disorders
- Many Holocaust survivors still suffer from high levels of anxiety and recurrent nightmares about their experiences
    - Many child survivors remain entrapped in a survival mode
- Many Vietnam War Vets experience psychological stress and anxiety
- **Rape trauma syndrome**
    - Fear of being alone, being in a crowd, often change residence, nightmares, decreased sexual enjoyment
    - 1/4 of rape victims felt they have no recovered psychologically six years after the rape
- People who report more negative life events, the more they report symptoms of psychological disorder
    - 3 ways this could happen
    - 1: negative life event scores causes psychological distress scores

    - 2: psychological distress causes negative life event
    - 3: **Neuroticism:** tendency of experience negative emotions increases both scores

Post-Traumatic Stress Disorder (PTSD)

- PTSD represents what can happen to victims of extreme stress and trauma
    - Severe anxiety, physiological arousal, and distress
    - Painful uncontrollable reliving of events in flashbacks, dreams, and fantasies
    - Emotional numbing and avoidance of stimuli associated with trauma
    - Intense survivor guilt where others will killed but the individual survived
- Traumas caused by human perpetrators, such as war, rape, assault, and torture tend to have more severe PTSD than natural disasters
- Women are more likely to develop PTSD than men
- Likelihood determined by the victim's social support, presence of significant childhood stresses, personality factors, coping strategies, and preexisting psychological conditions

Stress and Illness

- Stress can cause an entire spectrum of physical illness including common cold, cancer, heart disease, diabetes, and sudden death
- Within a month after the death of a spouse, bereaved widowers and widows begin to show a higher mortality rate compared to his/her peers
- Increase risk of chronic health conditions including arthritis, bronchitis, emphysema, stomach and intestinal ulcers
- Can worsen an already existing medical condition
- Stress hormones secreted by adrenal glands affect the activity of the heart by damaging the lining of the arteries, and cause fatty blockages in arteries
- Married couples who had hostile marital conflicts showed a measurable decrease in immune function 24 hours later
- Prolonged cortisol exposure can cause deterioration of the hippocampus and accompanying memory impairment
- Stress can cause people to behave in a way that's dangerous for their health
    - Eg. When diabetics are under stress, they are less likely to follow a strict diet and medication plan
    - People more likely to quit exercising

Vulnerability and Protective Factors

- **Vulnerability factors** increase people's susceptibility to stressful events
- **Protective factors** are environmental or personal resources that help people cope more effectively with stressful events

Social Support

- Knowledge that we can rely on others for support is an important vulnerability factor and blunts the impact of stress
- People with weak social ties are twice as likely to die than those with strong social ties
- Social supports enhances immune system functioning
- People feel that they are a part of a social system experience a greater sense of identity and meaning in their lives, which in turn results in greater psychological well being
    - Reduces loneliness and an increased feeling of control over stressors
    - Friends can prevent maladaptive stress responses such as drug and alcohol usage

- Students who share their negative emotions had stronger immune systems than those who did not
    - 50% fewer visits to the campus health center over the next six months
    - More research is needed to see if emotional purging is applicable in all situations
    - Since participants had the option to not share their experiences, perhaps personality factors play a role in it as well
- Werner's study of stress resilient children found in her longitudinal study that "without exception, all of the children who thrived had at least one person that provided them with consistent emotional support"

Cognitive Protective Factors: The Importance of Belief

Hardiness

- Three C's of hardiness are **commitment, control,** and **challenge**
- They are committed to their work, their family and believe what they do is important
- They view themselves as in control of the outcomes
- Views demands of the situation as challenges and opportunities rather than threats
    - Can actually stimulate higher levels of performance

Coping Self-Efficacy

- **Coping Self Efficacy:** the conviction that we can perform the behaviors necessary to cope successfully
    - Believing that we can overcome the circumstances

Optimism

- Pessimists have a greater risk for helplessness and depression
- Optimism is good for health and happiness

Personality Factors

- Type A people live under great pressure and are demanding of themselves and others
- Exaggerated sense of urgency including rapid talking, moving, walking and eating
- **Type A** is characterized by high levels of competitiveness and ambition as well as aggressiveness and hostility when things get in their way
- **Type B** people are more relaxed, more agreeable, and have far less sense of time urgency
- Type A people, even with other factors taken into account, have twice the likelihood of coronary heart disease (CHD)
- The culprit of CHD is mainly negative emotions, especially hostile or aggressive feelings
    - Suspicion, resentment, frequent anger, distrust, and antogonism
    - Tends to alienate others which reduces the amount of social support they receive
- **Type C** is a risk for cancer
    - Similar to Type A pattern
    - Likes to bottle up negative emotions which gets in the way of active coping and tend to feel helplessness and hopelessness in the face of severe stress
    - Bottling up emotions can be hazardous to one's health
    - Risk of death from cancer is much higher if emotions are not expressed
- Conscientiousness has the strongest link to physical health and longevity
    - 30% less likely to die and less likely to engage in risky behavior
    - Generally less likely to smoke and drink to excess and more likely to exercise, eat a balanced diet

Finding Meaning in Stressful Life Events

- Humanistic theorists claim that those who can find meaning with stressful events are less distressed

    - Eg. People finding meaning in the death of a loved one helped them cope with this loss
    - Religious beliefs can comfort people in times of crises

Physiological Reactivity

- **Physiological toughness** appears to be a protective factor
    - Involves the relations between **catecholamines** (including epinephrine and norepinephrine) and **Corticosteroids** (particularly cortisol) that mobilize the body's fight or flight response
    - Cortisol's effects last much longer and more damaging than catecholoamines
- Physiological toughness consists of
    - Low resting level of cortisol, low levels of cortisol secretion in response to stressors, and a quick return to baseline level of cortisol after the stress if over
    - Low resting level of catecholamine but a quick a strong catecholamine response when the stressor occurs
- Exercise produces catecholamine may account for exercise's health enhancing effects

Coping with Stress

- **Problem-focused coping** attempts to confront and deal directly with the demands of the situation or change the situation so that it's no longer stressful
    - Eg. Studying for a test
- **Emotion-focused coping** attempts to manage the emotional responses that result from it
    - Eg. Appraising the situation in a manner that minimizes its emotional impact or denying that any problem exists
- **Seeking social support**
    - Turning to others for assistance and emotional support

Effectiveness of Coping Strategies

- Problem-focused coping methods and seeking social support were associated with favorable adjustment to stressors
- Emotion-focused strategies that involve avoiding feelings or taking things out on others predicted depression and poorer adjustment
    - Adaptive emotion-focused strategies such as changing irrational thinking and learning to relax can reduce stress without avoiding or distorting reality

Controllability and Coping Efficacy

- When we cannot influence or modify a situation, problem-focused coping may do us little good and could make things worse
    - Emotion focused coping may be the most effective
- In a study, coping with virtual plane hijacking
    - Group 1: taught problem focused coping
    - Group 2: taught emotion focused coping
    - Group 3: control
- Because in this case, the situation is out of the participants' control emotion-focused coping was the most effective, followed by problem-focused coping, followed by the control group which received not training
- Courage to change those things that can be changed, forbearance to accept those that cannot be changed, and the wisdom to discern the difference

Bottling Up Feelings: The Costs of Constraint

- Inability to express negative feelings has been related to cancer and the use of denial or repressive coping strategies
- A program was developed to teach those who are emotionally constrained but has not

developed cancer
    - 90% of the participants who received training were still alive
    - 62% of people who had not received training had died from cancer and other ailments

Gender, Culture and Coping

- Men are more likely to use problem focused coping as a first strategy
- Women favor larger support networks and higher need for affiliation than men
    - Also favors emotion-focused coping
    - May be due to socialization
- Europeans and North Americans use problem-focused coping more than do Asian and Hispanic peoples who tend to favor emotion-focused coping and social support

Health Promotion and Illness Prevention

- Surgeon General of the US concluded that improvements in health are more likely to result from efforts to prevent disease and promote health than new drugs and medical technologies
- Current major killers are heart disease, cancer, and stroke are more attributed to behavioral factors
- Leading causes of death before life expectancy is largely attributed to alcohol, smoking, insufficient exercise, etc.
- **Health psychology** studies psychological and behavioral factors in prevention and treatment of illness and in maintenance of health
- **Health enhancing behaviors** serve to maintain or increase health such as exercise and healthy diet
- **Health compromising behaviors** are those that promote the development of illness

How People Change: The Transtheoretical Model

- **Transtheoretical model** identifies 6 major stages in the change process
    - Not a smooth process, people often move back and forth and make repeated efforts to change

1. **Precontemplation**
    - Don't perceive themselves as having a problem and has no desire to change
2. **Contemplation**
    - Person perceives a problem but has not yet decided to take action; will not take action until the perceived benefit outweighs the costs or effort involved
3. **Preparation**
    - Decided they want to change their behavior but has not actively begun
    - Developing a plan to take action within the next month
    - Already began to make small changes
4. **Action**
    - People actively begins to modify their behavior and their environment
    - Greatest commitment of effort and energy
5. **Maintenance**
    - If a person has avoided relapse and has controlled target behavior for 6 months, they are in the stage of maintenance
6. **Termination**
    - Change in behavior is so ingrained and controlled that the original problem behavior will never return

- Psychologists can use this model to apply **stage-matched intervention** designed to move the person toward the action, maintenance, and termination stages

Increasing Behaviors that Enhance Health

Exercise

- Sedentary lifestyle is a significant risk factor for coronary heart disease, diabetes and obesity
- 70% of North Americans are inactive
- **Aerobic exercise** is sustained activity such as jogging, swimming, and cycling that elevates heart rate and increases the body's need for oxygen
    - Slower resting heart rate, better oxygen utilization, reduced cholesterol levels
- Death rates were 1/3 to 1/4 lower among moderate exercisers than the less active group
- Inspired educational programs People have strong tendency to either avoid doing it or to discontinue it after a short period
    - Caused by low efficacy for success in exercising regularly
    - Type A personality (too busy to exercise)
    - Inflated estimates of current physical fitness (I'm already in great shape from walking to the fridge)
    - Inactive leisure pursuits (TV)

Weight Control

- 48% of Canadians aged 20 to 64 are overweight and 15% are obese
- 500% increase in childhood obesity between 1980 and 2004
- Obesity increases the risk for cardiovascular disease, kidney disease, and idabetes
- Fat around the abdomen is a far greater risk for acardiovascular disease, diabetes, and cancer than fat stored in other parts of the body
- Accumulation of abdominal fat is increased by **yo-yo dieting** that results in big weight fluctuations
- Strategies include limiting food intake to one part of the house, eating during meal times, and slowing down when eating
- Even those suffering from serious illness can benefit form health related programs
    - Experimental group received a behavioral self regulation program that targets health factors such as smoking, exercise, weight, nutrition, and medication adherence
    - After 4 years, control group worsened or showed no improvement
    - Those who received the behavioral self regulation program showed significant positive change in their health habits
        - Reduced dietary fat, lowered bad cholesterol, increased good cholesterol, increased their exercise, and raised their cardiovascular capacity
    - Those in the control group, 45% either died or had a cardiac emergency vs 24% in the experimental group

Reducing Behaviors that Impair Health

- On June 5, 1981, the Centers for Disease Control reported the first case of acquired immune deficiency syndrome
    - Now a world epidemic with 16,000 new cases daily
- AIDS caused by the **Human immunodeficiency virus (HIV)** which cripples the immune system by killing cells that coordinate the body's attack against pathogens which become the actual killers
- The virus changes rapidly, rendering vaccines ineffective
- Incubation period could be as long as 10 years, meaning that it could be passed on to many other people

Prevention Programs

- AIDS is as much a psychological problem as a medical one

- Prevention programs are designed to
    - Educate people about protective sex
    - Motivate people to change their behavior
    - Give support and encouragement
- Previously, prevention programs are targeted at gays who were the major at risk group
- Now focused towards adolescent population who often practice unprotected sex
- The success of the intervention program depends on the extent to which the individual's social system supports the desired changes
- Through the use of the social-cognitive theory, positive behaviors can be induced
    - Bandura's radio show was used as a positive role model and to correct misbeliefs about condoms and transmission of HIV
    - Positive role models had positive outcomes, negative role models with negative outcomes, and transitional role models who starts out negative but then becomes more positive

Combatting Substance Abuse

- Deaths from alcohol was 6,701 in 1992
    - Mostly from vehicle accidents, then liver cirrhosis and alcohol related suicides
- 82,076 hospitalized for alcohol related causes
- Economic costs of alcohol is roughly 7.5 billion, almost 3% of Canada's GDP
    - Come from loss of productivity, law enforcement and direct health care
- Roughly 640,000 with alcohol dependence in Canada
- Smoking is the largest cause of preventable death, killing about 1/2 million per year
- 51% of physical and 48% of sexual assaults indicate a relation to the use of illicit drugs and alcohol
- Substance abuse is highly associated with psychological disorders

Psychological Approaches to Treatment and Prevention

- Cognitive behavioral approaches have proven to be the most cost effective and successful in reducing abuse

Motivational Interviewing

- Drug and alcohol abusers must increase awareness of their problems, have a desire to take action, and believe that they can change
- **Motivational interviewing** leads a person to his or her own conclusions by asking questions that focus on discrepancies between the current state of affairs and the individual's ideal self image
- Following the client's decision to pursue behavior change, the counselor can then set specific goals and select from a menu of behavior change strategies

Multimodal Treatment Approaches

- Includes biological and psychological measures to induce change
    - Aversion therapy
    - Relaxation and stress management training to teach a person to adapt to stressful situations
    - Self monitoring procedures to help a person identify the antecedents and the consequences of the abuse behaviors
    - Coping and social skills training for dealing with high risk situations that trigger abuse
    - Marital and family counseling to reduce conflicts and increase social support for change
    - Positive reinforcement procedures to strengthen change
- Such program in an experiment with 427 alcoholics showed that 65% were totally

abstinent after 1 year

Relapse Prevention

- Overall, fewer than 30% o treated alcoholics remain improved 1 year after treatment
- 80% of those who quit smoking relapse within a year
- Most relapses occur when a person suffer a lapse (one time slip) when confronted with a high risk situations which include stressful events, interpersonal conflicts, and social pressure
- Increased likelihood occurs when people had not developed strong enough coping skills to deal successfully with the high risk situation
    - They feel a lack of self efficacy for resisting the temptation
- **Abstinence violation effect:** person becomes upset over personal failure to remain abstinent and views lapse as proof that he or she would never be able to resist temptation
    - Causes total relapse to occur
- Prevention strategies teaches people that a lapse means nothing more than the fact that the situation had exceeded their current coping ability and has given them insight on the cognitive, situational, and emotional antecedents they must learn to handle more effectively
    - Focused on increasing self efficacy and improvement

Harm Reduction Approaches to Prevention

- **Harm reduction** is a prevention strategy focused on reducing the harmful effects of a behavior when it occurs
    - Include needle and syringe exchange programs to reduce the spread of HIV infections
    - If an addictive behavior cannot be eliminated, harm reduction will minimize its harmful effects on person and society
- 50% of male and 40% of female university students meets the binge drinking criteria of more than 5 drinks on at least 3 occasions over the past 2 weeks
    - Increased rates of sexual abuse, violence, property destruction, etc.
- University intervention programs gave the experimental group feedback about their drinking behaviors and implications of their drinking
    - Showed to be effective in reducing harm

Pain and Pain Management

- Pain can be a stressor and a result of stress
- Pain tells us that the body is being threatened or has suffered damage
- Pain can trigger behavioral reactions to help us cope with the threat

Biological Mechanisms of Pain

- Pain receptors all found everywhere except the brain, bone, nail and nonliving parts of the teeth
- Reacts to intense mechanical, thermal, or chemical stimulation
- Pain has both a sensory and an emotional component
- **Suffering** is when both painful reactions and a negative emotional response are present

Gate Control Theory

- **Gate control theory** proposes that pain is a result of the opening and closing of gating mechanisms in the nervous system
- Two types of sensory fibers enter the spinal cord
    - Thin fiber conveys sharp pains
    - Thick fibers convey dull pain and touch information

- When thick fibers are stimulated, it closes the thin fiber gates from causing pain
    - Increase thick fiber impulses means decreased perception of pain
    - Accupuncture needles stimulate mostly thick fibers which closes off the pain gates
- The **central control mechanism** allows thoughts, emotions, and beliefs to influence the experience of pain which can control the spinal gates

The Endorphins

- Opiates have been used to relieve pain
    - Binds to specific receptor sites in the brain associated with pain perception
- Nervous system has its own analgesics (painkillers) with opiate like properties known as **endorphins**
    - Dulls pain by inhibiting the neurotransmitter activity involved in synaptic transmission of pain impulses from the spinal cord to the brain
        - Some are extremely powerful, one of them 200x more powerful than morphine
- In an experiment, endorphins were shown to be released at the thalamus (sensory switchboard), the amygdala (emotion center), and a sensory area of the cortex
- People differ in pain experiences deptie identical pain stimulation
    - Caused by the variations in the number of opioid receptors for endorphins and their ability to release endorphins
- When **naloxone** is injected into the blood stream, which counteracts the effects of endorphins, it causes a great decrease in the pain reducing effects of acupuncture
    - Suggests acupuncture normally releases endorphins
- **Stress-induced analgesia** is a reduction of perceived pain under stressful conditions
    - 65% of wounded soldiers during combat felt no pain at the time of their injury
    - Highly adaptive, fight or flight defense behavior must be given immediate priority
- Chronically high levels of endorphin release block the activity of the immune system cells that recognize and kill tumor cells

Cultural and Psychological Influences on Pain

Cultural Factors

- In some cultures, women do not see childbirth as a painful event and went to work in the fields immediately after
- Women report pain more frequently more than men and are more often treated for pain related disorders
    - most likely due to both biological and psychological differences
- In a society in India, a holy person performs a ceremony that requires him to hang from hooks through his back
    - Feels little pain and recovers almost immediately
- Ethnic groups differ greatly in their interpretation of pain and the amount of suffering they experience

Meanings and Beliefs

- Only 25% of severely wounded soldiers needed pain medication while 80% of civilian men who received similar wounds needed pain meds
    - Soldiers saw pain as evacuation from the war zone and a socially acceptable ticket back home
    - For civilians, it meant a major life disruption and possible complication
- When using placebos for morphine
    - 42% reported relief from placebos compared to 67% relief from the actual drug
    - Placebos only work if people believe they are going to work

- Those who believe they can control their pain reported less pain and induced an endorphin release

Personality Factors and Social Support

- Pain and suffering can be used to attain certain goals
    - For those bitter and deprived, it can be used to dramatize their unhappiness, elicit caring, sympathy or guilt from others
- People who have **neuroticism**, tendency to experience negative emotions, report higher physical pain
- Those who are optimistic and exhibit a sense of personal control reported lower pain perception and less suffering
- Those who are more depressed and anxious reported greater pain
- Greatest pain and distress occurred when women who lost a significant source of social support

Psychological Techniques for Controlling Pain and Suffering

Cognitive Strategies

- **Dissociative strategy** involves dissociating, or distracting oneself from painful sensory input
    - Directing attention to something else, imagining a pleasurable experience, or repeating a word
    - Eg. Recreational joggers ran 32% longer when they focused on a single spot and said "down" every time they took a step
    - In a burn center, patients were given virtual reality goggles and reported much less pain during wound cleansing
- **Associative strategies** is when you focus attention to the physical sensations and study them in a detached and unemotional fashion
    - When pain is intense, it is more effective than dissociative strategies
        - A point where pain is too intense and dissociative strategies cannot ignore the stimuli

Hospital Interventions: Giving Patients Informational Control

- Information can be used to reduce anxiety and contribute to positive medical outcomes
- Useful information includes:
    - **Sensory information:** what you will feel after the operation
        - Help you see that what you feel is normal and a sign of recovery
    - **Procedural information:** what's happening during the surgery itself and why each process is done
    - **Coping guidance:** handling the pain or other complications from the surgery

Key Behavioral Strategy: Becoming Active Again

- Those who avoid activity or become overprotective about an injured body part are at risk for developing a chronic pain condition