September 6:

- Psychology is an extremely young/new field of science.
- Psychology first began in the late 1800's. So, it's just over 150 years old.
- A **soul** is an immaterial, metaphysical part of the human. As such, souls do not conform to the rules of physics, chemistry and biology.
- To pursue something scientifically, one must first assume that the behaviour of that thing conforms to some sort of natural laws, laws that can eventually be understood, specified, and used to predict future behaviour.
- Souls are spiritual entities and, as such, they do not conform to natural laws. Given this, trying to understand them via a scientific process is pure folly.
- **Animism** is the religious belief that objects, places and creatures all possess a distinct spiritual essence/soul.
  E.g. Back in the really old days, people believed that everything was made up of 4 elements: water, air, fire and earth. Furthermore, they did not know/understand the concept of gravity. Based on that, people believed that if you let go of a metal object, it fell to the earth because earth items liked to be with other earth items. Similarly, they believed that smoke from fires went up because air items like to be with other air items. In that sense, they gave every object a soul.
  E.g. Back in the really old days, people believed that if a tornado came, it was because they had offended a god and that god either took form as a tornado or sent a tornado. To appease the god, people would sacrifice a virgin by throwing the virgin in a volcano. This is known as **Volcano Bound Virgins**. Even the weather was connected with a spiritual/animism idea.
- Humans like things to make sense. As a result, some people say that animism, intelligence and magic were born out of people's ignorance and their desire for things to make sense. It's the easy way for people to make sense of something they don't understand. Magic is you not understanding what it is your eyes are seeing and how they are seeing it.
  E.g. If you see a magic trick/show, say a levitating act, and you don't know how that happened, you think that's magic. However, if you know how the magician was able to be levitated, even if you are still impressed, the magic is lost.
  E.g. If you see a tornado, but you don't know how the tornado was created, you might think that a god sent it because they were angry. In this sense, some people believe that animism was born out of people's ignorance and their desire for things to make sense.
- **Rene Descartes (1596 – 1650):**
  - Rene was very smart from a young age. He is a **polymath**, someone who makes major contributions to multiple fields. Rene made contributions in philosophy, math, etc.
  - However, like many people who were very smart, Rene had trouble fitting in with people his own age. Also had a lot of mental issues/mental health issues. He had anxiety, nervous breakdowns and was uncomfortable fitting in with other people.
  - Rene took a trip to the Palace of Versailles, Paris, to relax. At a park, he saw a statue of Diana, goddess of the hunt. He wanted to get a closer

look, so he walked towards it. While walking to the statue of Diana, a statue of Neptune comes out behind a bush and blocks his path. Rene was blown away and extremely confused by this because it seemed like the statue of Neptune intentionally moved to block him from seeing the statue of Diana. This incident messed up his mind for a long time. Prior to this moment, he thought that you could tell if something has a soul if it moves with intention. I.e. Prior to this moment, he thought "Things with a soul move with intention." After the incident, he wasn't sure of his hypothesis anymore because he just saw a statue (A soulless object) move with intention. He thought, "Does this mean that other objects that move with seeming intention also not have a soul? Maybe are they machines, too. And motion does not imply a soul." From this incident, he believed that animals DO NOT have a soul and were fancy, hydraulic machines.

- Rene endorsed animal testing and performing vivsections (Nailing animals to boards and cutting them open while they were alive) on animals because he thought that animals were machines and had no soul. When other people pointed out that the animals were screaming and were under stress, Rene said that machines also make noise and can be under stress, and that if you're concerned about the noise the animal is making, cut the vocal cords first.
- With humans, Rene believed in **Cartesian Dualism**, which is the belief that humans are part machine but we also have a soul, which connects with the body at the pineal gland. He believed that there are two distinct ways behaviour could emerge for humans. The first way is that our behaviour and actions are controlled by the machine aspect. The second way is that our behaviour and actions are controlled by our soul.
- Rene is saying that humans are not fully spirits in a material world, and that we are very much material, but we also have a soul component. From this, Rene opened up the idea for humans to view ourselves the same way we view the rest of the world, because from a scientific perspective, this means that while we can't study the metaphysical (soul) component of humans, we can study the physical (machine) component.
- During Rene's time, the Church had a lot of influence and power in Europe. So, Rene was on tricky ground. The Church had providence over the soul and Rene didn't want to challenge that. In the end, the Church did not mind Rene's idea that humans were part machines but also had a soul.

- **John Locke (1632-1704):**
  - Locke came just after Rene.
  - He thought that the "Mind is a machine", but didn't have a name for it. Later on, James Mill coined the term **Materialism** from this idea.
  - Locke coined the term **La Table Rassa**, which is a theory that humans were born a blank slate. Locke had the idea that when someone was born, they could become anything in life. He thought that a person's

experiences defined them and their future. (This idea came before the concept and understanding of genetics.) In psychology, this concept is called **The Nurture View**, which contrasts **The Natural View** which states that you are defined by your genetics. Locke started the **Nurture vs Nature debate**, which debated whether genetics or experiences define humans the most, and had a strong nurture view.

- Locke believed in **empiricism**, which is the idea that people should test their ideas by doing experiments. Philosophers used to come up with lots of ideas but did not do any experiments to verify those ideas. Locke was one of the first people to say that people should be doing experiments and gathering data to see if their hypothesis was true.

- **James Mill (1773 – 1836):**
  - Coined the term **Materialism** from Locke's "Mind is a machine" philosophy.
  - Materialism, in this connotation, is the notion that things are composed of material that follow natural laws.
  - Mill believed that humans are totally material.
  - Locke and Mill went a step further than Rene Descartes did. Rene thought that humans were machines with a soul, while Locke and Mill thought humans were completely machines.
- **Luigi Galvani (1737-1798):**
  - Back in the day, there were no "professional scientists." Science was a hobby which people did in their basement or backyard. To show off their discoveries, the scientists would meet up and tell the other people in their group what they discovered.
  - At one of these meetings, Luigi Galvani showed off that by applying electricity to a cut off frog leg, it made the leg move. He showed that by applying electricity to a muscle, it activated the muscle.
  - Rene believed our biology was hydraulically driven, but Luigi and others believed that it was electricity, not hydraulics. Luigi believed that humans were bio-electric machines.
- **Pierre Florens (1774-1867):**
  - Florens built on Luigi's idea of applying electricity to a muscle, but he was more interested in how the brain controlled functions.
  - Pierre started doing **ablation studies**, which is running an animal through a series of tasks and then doing surgery on the animal where you destroy part of the animal's brain to see how they function afterwards. If you did damage to the right side of the brain, the animal's left side would be paralyzed. If you did damage to the back of the brain, the animal would be blind. Pierre found that if you did damage to specific parts of the brain, the animal would have very specific deficits.
    The brain was starting to seem like a machine.
- **Paul Broca (1824-1880):**
  - Paul was a medical doctor who found a lot of people that had trouble producing language, but could understand it fine and asked if he could

inspect their brain when they died. After inspecting their brains, he found that they all had damage to the same part of the brain, the left, front area. This area is called **Broca's area**.

September 9:

- Most scientists such as Einstein and Darwin believed that people had a soul. However, they believe that whatever they are studying, such as the human memory, is not spiritual and that it follows natural laws.
- Many scientists and psychologists wanted to "reverse engineer" the machine aspect of humans.
- A lot of the early psychologists were from Germany. Germany during the mid to late 1800's was very economically powerful and because of this, they began to think of new ways to invest their money. One of the things they invested their money into was research and development (R&D), because they wanted to make their country and people smarter and more competitive. However, since biology, chemistry and physics had been around for a long time, they looked for other, newer places to invest and one of the places was psychology.
- **Hermann von Helmholtz (1821-1894):**
    - Measured the speed of neural impulses.
    - When scientists cut open animals, they saw a lot of nerve fibres. To the scientists, the nerve fibres were like cables transmitting information and energy from the brain to other parts and they wanted to measure how fast our body transmits information and energy.
    - Helmholtz discovered that our nerves send signals at a relatively slow rate compared to modern electronics.
    - Showed that something that seemed impossible to measure was possible if you were creative and thought about it well enough.
- **Ernst Weber (1795-1878):**
    - Studied **psychophysics**, which is the study of the relationship between the physical world and the mental representation of that world.
    - Was a colleague of Gustav Fechner and they did a lot of similar work.
    - Psyche came from the Latin word for soul.
    - Aristotle believed that there were 3 levels of life:
        1. **Plants:** All plants did was essentially grow. They turned nutrients into mass.
        2. **Animals:** While animals grew, too, they also had senses. I.e. Animals could sense the external world.
        3. **Humans:** Humans could grow, sense the external world and could think about it rationally.
    - What Weber did was that he blindfolded people and put a weight (of either different or same weight) in each hand and asked the person which weight they thought was heavier or if both weights weighed the same. (This is a very similar experiment done by Gustav Fechner.) Weber discovered that if there's at least a 10% difference between what the two weights weighed, then people could feel which weight is heavier.
      I.e. If one weight weighed 10g and the other weight weighed 11g, then

people could feel which weight is heavier.
I.e. If one weight weighed 100g and the other weight weighed 110g, then people could feel which weight is heavier. However, if one weight weighed 100g and the other weight weighed 101g, then people could not feel which weight is heavier.

- **Willhelm Wundt (1832-1920):**
  - Known as the father of psychology because he opened the first psychology lab, which was in Germany. A lot of the psychologists that followed were his students.
  - Was the first to refer to himself as a psychologist.
  - He wrote the first psychology textbook "The Principles of Physiological Psychology".
  - He liked introspection, and would teach students how to observe what's in their mind. However, this was controversial because you're relying on the person being truthful and/or the person could be describing his/her thoughts improperly.
  - Wundt was a structuralist. **Structuralism** is an attempt to analyze conscious experience by breaking it down into basic elements, and to understand how these elements work together.
- **Darwin (1809-1882):**
  - He changed everything in the sciences.
  - Biologists pre-Darwin and even Darwin himself were structuralists. They created classes of animals by their physical features. However, the scientists never considered why an animal had the physical features it had. However, Darwin pushed the idea that the physical features an animal has is there for a reason, which got people to think.
  - Also came up with the theory of "**Survival of the fittest**", which means that if you are best designed for your habitat, then you will survive.
  - Pushed for **functionalism** instead of structuralism, which meant focus on why something happens instead of what that something is.
  - Structuralism largely gave way to functionalism, a focus on the purpose of the mental world, not what it "looks" like.
- **William James (1842-1910):**
  - Was more of a philosopher than a psychologist. However, he is considered a psychologist because he thought a lot about psychological things, such as how does attention work, how does memory work, etc. He didn't do a lot of experiments.
  - His ideas/thoughts have become the hypotheses of many psychologists and a lot of his ideas turned out to be correct.
  - In the psychology world, James was one of the first functionalists.
- **Artificial selection**, also known as **selective breeding**, is the intentional reproduction of individuals in a population that have desirable traits so that their descendents would have these traits, too.
- A lot of early psychologists didn't consider themselves a psychologist. They wanted to prove that you could scientifically study the mind as a lot of scientists

back then were skeptical of that and still thought humans were spirits in a material world.

- **Herman Von Ebbinghaus (1850-1909):**
  - Was interested in memory and read a lot of William James' ideas and wanted to do experiments based on the ideas.
  - For one of his experiments, he wrote 40 CVCs (Consonant Vowel Consonant), made up words that started with a consonant, followed by a vowel and ended with a consonant on cards and tried to memorize all of them. Then, he tried to write all 40 CVCs out multiple times, with a gap in between each time and without looking at the cards at all. He found out that over time, he'd remember less and less words. This is seen below on the graph and we now call this the **Forgetting Function**.
  - After a few of these tests, Ebbinghaus relearned the words. However, he kept track of how long it took him to learn all 40 words the first time and how long it took for him to relearn it, and he found that relearning the words took way less time. He came to the conclusion that the words were gone but not forgotten.
  - This was the pinnacle of trying to show the rest of the world that this new science of psychology is a science and that we can scientifically learn/study about the mind.
- **Sigmund Freud (1856-1939):**
  - Was trained as a medical doctor (physiologist), not as a scientist.
  - Operated on the concept of the **medical model**, which is the concept of using medical ideas to treat disorders of emotions, thoughts, and behaviour.
  - Before Freud, most mentally ill people would get locked up in asylums, but Freud challenged that idea. He said that many people with mental illness were leading normal lives otherwise. He invented **psychoanalysis**, a psychological approach that attempts to explain how behaviour and personality are influenced by unconscious processes, to find the root cause of why someone has a mental illness.
  - Invented psychoanalysis, promoted cocaine, spoke a lot about sexual and aggressive urges, popularized his notion of psychology, and drove (and still does) scientists nuts!
  - Freud lived in the Victorian Era where people were very obsessed about being proper. So, they did not openly talk about sexual issues or aggression. However, Freud said that everything's about sex or aggression. Freud said that we can satisfy all of our urges except for sex or aggression, which fasciated a lot of people.
  - Freud had a notion of unconscious things playing out in little behaviours that you do. While this made Freud popular with the general public, it did not make him popular with other scientists and this almost redefined psychology.
  - Scientifically-minded psychologists hated Freud so much because they could never disprove his theories. Freud would come up with an

explanation for every behaviour and so he was never wrong. It's all about the lack of testable theories. To scientists, if something cannot be proven wrong, it's useless. Furthermore, prior to Freud, psychologists focused on average humans. However, Freud focused on people with mental illness and birthed the concept of **clinical psychology**, the field of psychology that concentrates on the diagnosis and treatment of psychological disorders. This split psychology into two types, experimental psychology and clinical psychology, and early on, there was a division between the two types because early clinicians didn't care about science and operated on the concept of the medical model.

- **European scientists reacted to Freud in two ways:**
    - **Gestalt Psychology:** Trying to understand the laws underlying our amazing ability to acquire and maintain stable percepts in a noisy world.
      I.e. Looks at the human mind and behaviour as a whole.
    - **Humanistic psychology:** Born largely as a direct counter in response to Freud's focus on sex and aggression. It focused on the positive aspects of humanity.
- **North American scientists reacted to Freud in one way:**
    - **Behaviourism/S-R Psychology/Rat Psychology:** An approach that dominated the first half of the 20th century of North American psychology and had a singular focus on studying only observable behaviour, with little to no reference to mental events or instincts as possible influences on behaviour.
    - Influential psychologists included Ivan Pavlov (1849 - 1936), John B. Watson (1878 - 1958), and B.F. Skinner (1904 – 1990). Pavlov started this idea and even though he was Russian, because many North American psychologists built on his ideas, we call this the North American scientists' reaction to Freud.
    - Wanted to study things that can be measured and manipulated in objective/scientific ways. Wanted to see what the test subject does as a function of certain stimuli (certain situations we put the animal in). Only cared about the stimuli and the test subject's reaction to it.

- **The Cognitive Revolution:**
    - Getting into the 1950's to 1960's.
    - Computers were around at this time and became a model for the human mind. Computers have memory, could take input, process that input and produce an output based on the input. Since computers were physical, this made the human mind feel more concrete. Psychologists began studying the human mind and memory again.
    - An important topic psychologists began to study was attention and how they could enhance the memory of humans. In America, there were a lot of wars from the early to mid 1900's (Spanish-American War, WW1, WW2, Korean War, Vietnam War) and the army was interested in finding new ways for them to do better at wars. One of the tasks that drove the

army to embrace psychology was radar operator task (A person staring at a radar screen for 8 hours each day and sending signals if they saw any enemy vehicles on the screen). The army found out that after a few hours, the radar operator wasn't focused anymore and didn't notice when an enemy vehicle showed up on the screen. This made the army very interested in studying attention.

- **Social psychology** is the study of the influence of other people on our behaviour.

Textbook:

- **Section 1.1:**
- **The Science of Psychology:**
- One of the reasons psychology is such an exciting field is that it is easy to see how this field of study relates to your own life.
- Psychology is visceral. We feel emotions, we take in sensations, and we produce behaviours such as thoughts and actions. Psychology is you.
- **Psychology** is the scientific study of behaviour, thought, and experience, and how they can be affected by physical, mental, social, and environmental factors.
- Some of the overarching goals of psychology include:
    - To understand how different brain structures work together to produce our behaviour.
    - To understand how nature (genetics) and nurture (our upbringing and environment) interact to make us who we are.
    - To understand how previous experiences influence how we think and act.
    - To understand how groups, family, culture, and crowds affect the individual.
    - To understand how feelings of control can influence happiness and health.
    - To understand how each of these factors can influence our well-being and could contribute to psychological disorders.
    - Critically, these points are not independent of one another.
- Every topic in psychology could be examined from a biological, cognitive, or sociocultural perspective.
- **The Scientific Method:**
- A person who carefully follows a system of observing, predicting, and testing is conducting science, whether the subject matter is chemicals, physiology, human memory, or social interactions.
  I.e. Whether a field of study is a science, or a specific type of research is scientific, is based not on the subject but on the use of the scientific method.
- The **scientific method** is a way of learning about the world through collecting observations, developing theories to explain them, and using the theories to make predictions.
- **Hypotheses Making Predictions:**
- A **hypothesis** is a testable prediction about processes that can be observed and measured.
- A hypothesis can be supported or rejected. You cannot prove a hypothesis because it is always possible that a future experiment could show that it is wrong

or limited in some way. This support or rejection occurs after scientists have tested the hypothesis.

- For a hypothesis to be testable, it must be falsifiable, meaning that the hypothesis is precise enough that it could be proven false. This precision is also important because it will help future researchers if they try to replicate the study to determine if it the results were due to chance.
- Horoscopes make very general predictions, typically so much so that you could easily find evidence for them if you looked hard enough, and perhaps stretched an interpretation of events a bit. In contrast, a good scientific hypothesis is stated in more precise terms that promote testability.
- Astrology is often referred to as **pseudoscience**, an idea that is presented as science but does not actually utilize basic principles of scientific thinking or procedure.
- **Theories Explaining Phenomena:**
- A **theory** is an explanation for a broad range of observations that also generates new hypotheses and integrates numerous findings into a coherent whole.
- Theories are built from hypotheses that are repeatedly tested and confirmed.
- An essential quality of scientific theories is that they can be supported or proved false with new evidence.
- If a hypothesis is supported, it provides more support for the theory. In turn, good theories can be used to generate new hypotheses.
- However, if the hypothesis is not supported by the results of a well-designed experiment, then researchers may have to rethink elements of the theory.
- Theories are not the same as opinions or beliefs.
- All theories are not equally plausible.
- A good theory can explain previous research and can lead to even more testable hypotheses.
- The quality of a theory is not related to the number of people who believe it to be true.
- Testing hypotheses and constructing theories are both part of all sciences.
- **The Biopsychosocial Model:**
- The **biopsychosocial model** is a means of explaining behaviour as a product of biological, psychological, and sociocultural factors.
- Biological influences on our behaviour involve brain structures and chemicals, hormones, and external substances such as drugs.
- Psychological influences involve our memories, emotions, and personalities, and how these factors shape the way we think about and respond to different people and situations.
- Social factors such as our family, peers, ethnicity, and culture can have a huge effect on our behaviour.
- Importantly, none of these levels of analysis exists on its own. These levels influence each other. Almost every moment of your life is occurring at all three levels.

- **Building Scientific Literacy:**
- **Scientific literacy** is the ability to understand, analyze, and apply scientific information.
- Scientific literacy involves gathering knowledge about the world, explaining it using scientific terms and concepts, thinking critically, and applying this knowledge to relevant, real-world situations.
- We have to examine whether the ideas being presented were scientifically tested, and whether those studies were designed properly. Doing so allows us to separate the information that we should find convincing from the information that we should view with caution. It will also allow you to better analyze the information. Finally, we want to generalize the results. Generalization shows us that the studies conducted in universities and hospitals can provide insight into behaviours that extend far beyond the confines of the lab.
- **Critical Thinking, Curiosity, and a Dose of Healthy Skepticism:**
- Critical thinking involves exercising curiosity and skepticism when evaluating the claims of others, and with our own assumptions and beliefs.
- Critical thinking does not mean being negative or arbitrarily critical. Rather, it means that you intentionally examine knowledge, beliefs, and the means by which conclusions were obtained. Critical thinking involves cautious skepticism.
- To improve your ability to think critically, you should develop the following habits and skills:
    - **Be curious.** Simple answers are sometimes too simple, and common sense is not always correct.
    - **Examine the nature and source of the evidence.** Not all research is of equal quality.
    - **Examine assumptions and biases.** This includes your own assumptions as well as the assumptions of those making the claims.
    - **Avoid overly emotional thinking**. Emotions can tell us what we value, but they are not always helpful when it comes to making critical decisions.
    - **Tolerate ambiguity.** Most complex issues do not have clear-cut answers.
    - **Consider alternative viewpoints and alternative interpretations of the evidence.**
- Scientific and critical thinking involves the use of the **principle of parsimony**, which states that the simplest of all competing explanations of a phenomenon should be the one we accept.
- **Section 1.2:**
- **Psychology's Philosophical and Scientific Origins:**
- Science is more than a body of facts to memorize or a set of subjects to study. Science is actually a philosophy of knowledge that stems from two fundamental beliefs: empiricism and determinism.
- **Empiricism** is a philosophical tenet that knowledge comes through experience. In the scientific sense, empiricism means that knowledge about the world is based on careful observation, not on common sense or speculation.
- **Determinism** is the belief that all events are governed by lawful, cause-and-effect relationships. This is easy enough when we discuss natural

laws such as gravity. But does the lawfulness of nature apply to the way we think and act? Does it mean that we do not have control over our own actions? This interesting philosophical debate is often referred to as **free will versus determinism**.

- Psychological science is both empirical and deterministic.
- **Influences from the Ancients Philosophical Insights into Behaviour:**
- In ancient Greece, the physician Hippocrates (460–370 BCE) developed the world's first personality classification scheme. The ancient Greeks believed that four humours or fluids flowed throughout the body and influenced both health and personality. These four humours included blood, yellow bile, black bile, and phlegm. Different combinations of these four humours were thought to lead to specific moods and behaviours.
- Galen of Pergamon (127–217), arguably the greatest of the ancient Roman physicians, refined Hippocrates's more general work and suggested that the four humours combined to create temperaments, or emotional and personality characteristics that remained stable throughout the lifetime. Galen's four temperaments (each related to a humour) included:
    - Sanguine (blood), a tendency to be impulsive, pleasure-seeking, and charismatic.
    - Choleric (yellow bile), a tendency to be ambitious, energetic, and a bit aggressive.
    - Melancholic (black bile), a tendency to be independent, perfectionistic, and a bit introverted.
    - Phlegmatic (phlegm), a tendency to be quiet, relaxed, and content with life.
- Although such a classification system is primitive by modern standards, the work of Hippocrates and Galen moved the understanding of human behaviour forward by attempting to categorize different types of personalities.
- Psychology also did not immediately benefit from the scientific revolution of the 1500s and 1600s. Once the scientific method started to take hold around 1600, physics, astronomy, physiology, biology, and chemistry all experienced unprecedented growth in knowledge and technology. But it took psychology until the late 1800s to become scientific. One of the reasons is zeitgeist, a German word meaning "spirit of the times."
- **Zeitgeist** refers to a general set of beliefs of a particular culture at a specific time in history.
- The power of zeitgeist can be very strong, and there are several ways it prevented psychological science from emerging in the 1600s. Perhaps most important is that people were not ready to accept a science that could be applied to human behaviour and thought. To the average person of the 1600s, viewing human behaviour as the result of predictable physical laws was troubling. Doing so would seem to imply the philosophy of **materialism**: the belief that humans, and other living beings, are composed exclusively of physical matter. Accepting this idea would mean that we are nothing more than complex machines that lack a self-conscious, self-controlling soul. The opposing belief, that there are

properties of humans that are not material (a mind or soul separate from the body), is called **dualism**.

- **Influences from Physics Experimenting with the Mind:**
- The initial forays into scientific psychology were conducted by physicists and physiologists.
- One of the earliest explorations was made by Gustav Fechner (1801–1887), who studied sensation and perception.
- Fechner coined the term **psychophysics**, which is the study of the relationship between the physical world and the mental representation of that world.
- **Influences from Evolutionary Theory The Adaptive Functions of Behaviour:**
- Around the same time Fechner was doing his experiments, Charles Darwin (1809–1882) was studying the many varieties of plants and animals found around the world. Darwin noticed that animal groups that were isolated from one another often differed by only minor variations in physical features. These variations seemed to fine-tune the species according to the particular environment in which they lived, making them better equipped for survival and reproduction.
- Darwin's theory of evolution by natural selection was based on his observations that the genetically inherited traits that contribute to survival and reproductive success are more likely to flourish within the breeding population. These specific traits differ across locations because different traits will prove beneficial in different environments. This theory explains why there is such a diversity of life on Earth.
- Darwin's theory also helps to explain human and animal behaviour. As Darwin pointed out in The Expression of the Emotions in Man and Animals, behaviour and physical traits are shaped by natural selection.
- **Influences from Medicine: Diagnoses and Treatments:**
- Medicine contributed a great deal to the biological perspective in psychology. It also had a considerable influence on the development of **clinical psychology**, the field of psychology that concentrates on the diagnosis and treatment of psychological disorders. A research topic that impacted both fields was the study of localization of brain function, the idea that certain parts of the brain control specific mental abilities and personality characteristics.
- In the mid-1800s, localization was studied in two different ways:
    1. **Phrenology:**
        a. Franz Gall (1758–1828), Johann Spurzheim (1776–1832) and their followers believed that the brain consisted of 27 "organs," corresponding to mental traits and dispositions that could be detected by examining the surface of the skull.
        b. They believed that different traits and abilities were distributed across different regions of the brain.
        c. If a person possessed a particular trait or ability, then the brain area related to that characteristic would be larger. The larger brain areas would cause bumps on a person's head, so, by measuring the bumps on a person's head, proponents of phrenology believed that

it would be possible to identify the different traits that an individual possessed.

2. **The study of brain injuries and the ways in which they affect behaviour:**
    a. Had a scientific grounding that phrenology lacked.
    b. Physician Paul Broca found that a patient who had difficulties producing spoken language had brain damage in an area of the left frontal lobes of the brain (near his left temple).
    c. Prussian physician Karl Wernicke found that damage to another area in the left hemisphere led to problems with speech comprehension.
    d. Doctors in Vermont described a railroad employee who became impulsive and somewhat childlike after suffering damage to his frontal lobes.

- **Psychosomatic medicine** is the branch of medicine that studies and treats disorders in which physical symptoms are influenced by psychological factors.
- Sigmund Freud (1856–1939) began to use hypnosis to treat his own patients.
- Freud was particularly interested in how hypnosis seemed to have cured several patients of hysterical paralysis, a condition in which an individual loses feeling and control in a specific body part, despite the lack of any known neurological damage or disease. These experiences led Freud to develop his famous theory and technique called psychoanalysis.
- **Psychoanalysis** is a psychological approach that attempts to explain how behaviour and personality are influenced by unconscious processes.
- Freud acknowledged that conscious experience includes perceptions, thoughts, a sense of self, and the sense that we are in control of ourselves. However, he also believed in an unconscious mind that contained forgotten episodes from early childhood as well as urges to fulfill self-serving sexual and aggressive impulses. Freud proposed that because these urges were unconscious, they could exert influence in strange ways, such as restricting the use of a body part. Freud believed hypnosis played a valuable role in his work. When a person is hypnotized, dreaming, or perhaps medicated into a trance-like state, he thought, the psychoanalyst could have more direct access into the individual's unconscious mind. Once Freud gained access, he could attempt to determine and correct any desires or emotions he believed were causing the unconscious to create the psychosomatic conditions.
- Although Freud did not conduct scientific experiments, his legacy can be seen in some key elements of scientific psychology.
    1. Many modern psychologists make inferences about unconscious mental activity, just as Freud had advocated, although not all of them agree with the specific theories proposed by Freud.
    2. The use of medical ideas to treat disorders of emotions, thought, and behaviour, an approach known as the **medical model**, can be traced to Freud's influence.

3. Freud incorporated evolutionary thinking into his work. He emphasized how physiological needs and urges relating to survival and reproduction can influence our behaviour.
4. Freud placed great emphasis on how early life experiences influence our behaviour as adults.

- **The Influence of Social Sciences Measuring and Comparing Humans:**
- A fifth influential force came out of the social sciences of economics, sociology, and anthropology. These disciplines developed statistical methods for measuring human traits, which soon became relevant to the emerging field of psychology. An early pioneer in measuring perception and in applying statistical analyses to the study of behaviour was Sir Francis Galton.
- Galton noticed that great achievement tended to run in families; as a result, he came to believe that heredity (genetics) could explain the physical and psychological differences found in a population.
- To support his beliefs, Galton developed ways of measuring what he called **eminence**, a combination of ability, morality, and achievement. One observation supporting his claim for a hereditary basis for eminence was that the closer a relative, the more similar the traits.
- Galton was one of the first investigators to scientifically take on the question of **nature and nurture relationships**, the inquiry into how heredity (nature) and environment (nurture) influence behaviour and mental processes. Galton came down decidedly on the nature side, seemingly ignoring the likelihood that nurturing influences such as upbringing and family traditions, rather than biological endowments, could explain similarities among relatives.
- Galton's beliefs and biases led him to pursue scientific justification for **eugenics**, the science of improving a human population by controlled breeding to increase the occurrence of desirable heritable characteristics.
- Galton promoted the belief that social programs should encourage intelligent, talented individuals to have children, whereas criminals, those with physical or mental disability, and non-White races should not receive such encouragement.
- Ultimately, Galton's beliefs in eugenics led to disastrous consequences.
- In modern times, biological and genetic approaches to explaining behaviour are thriving and with the advent of new brain-imaging techniques. This area of psychology, biological psychology, is poised to provide new and important insights into the underlying causes of our behaviour.
- **The Beginnings of Contemporary Psychology:**
- By the late 1800s, the zeitgeist had changed so that the study of human behaviour was acceptable. Ideas flourished. Most importantly, researchers began to investigate behaviour in a number of different ways.
- **Structuralism and Functionalism The Beginnings of Psychology:**
- Most contemporary psychologists agree that Wilhelm Wundt (1832–1920) was largely responsible for establishing psychology as an independent scientific field.
- Wundt established the first laboratory dedicated to studying human behaviour in 1879 at the University of Leipzig, where he conducted numerous experiments on how people sense and perceive.

- His primary research method was **introspection**, meaning “to look within.”
- Introspection required a trained volunteer to experience a stimulus and then report each individual sensation he or she could identify.
- Wundt also developed reaction time methods as a way of measuring mental effort.
- What made Wundt’s work distinctly psychological was his focus on measuring mental events and examining how they were affected by his experimental manipulations.
- Edward Titchener, a student of Wundt, adopted the same method of introspection used by Wundt to devise an organized map of the structure of human consciousness. His line of research, **structuralism**, was an attempt to analyze conscious experience by breaking it down into basic elements, and to understand how these elements work together.
- Titchener chose the term elements deliberately as an analogy with the periodic table in the physical sciences. He believed that mental experiences were made up of a limited number of sensations, which were analogous to elements in physics and chemistry. The challenge for psychologists was to determine which elements were grouped together during different conscious experiences and to figure out what caused these specific groupings to occur.
- William James, a trained physician, developed the theory of **functionalism** by building on Darwin’s evolutionary principles. **Functionalism** is the study of the purpose and function of behaviour and conscious experience. This contrasts structuralism.
- According to functionalists, in order to fully understand a behaviour, one must try to figure out what purpose it may have served over the course of our evolution. These principles are found today in the modern field of **evolutionary psychology**, an approach that interprets and explains modern human behaviour in terms of forces acting upon our distant ancestors.
- **The Rise of Behaviourism:**
- **Behaviourism** is an approach that dominated the first half of the 20th century of North American psychology and had a singular focus on studying only observable behaviour, with little to no reference to mental events or instincts as possible influences on behaviour.
- The credit for discovering classical conditioning typically goes to a Russian physiologist named Ivan Pavlov (1849–1936). Pavlov noticed that the dogs in his laboratory began to salivate when the research technician entered the room and turned on the device that distributed the food. Importantly, salivation occurred before the delivery of food, suggesting that the dogs had learned an association between the technician and machine noises and the later appearance of food.
- **Radical Behaviourism:**
- Edward Thorndike (1874–1949) showed that the frequency of different behaviours could be changed based on whether or not that behaviour led to positive consequences.
- In Skinner’s view, the foundation of behaviour was how an organism responded to rewards and punishments. This is known as **radical behaviourism**.

- **Humanistic Psychology Emerges:**
- Psychology, by the mid-20th century, was dominated by two perspectives, behaviourism and Freudian psychoanalytic approaches, which had almost entirely removed free will from the understanding of human behaviour.
- To the behaviourists, human experience was the product of a lifetime of rewards, punishments, and learned associations. To the psychoanalysts, human experience was the result of unconscious forces at work deep in the human psyche. From both perspectives, the individual person was merely a product of forces that operated on her, and she had little if any control over her own destiny or indeed, even her own choices, beliefs, and feelings.
- In contrast to these disempowering perspectives, a new movement of psychologists arose, which emphasized personal responsibility, free will, and the universal longing for growth, meaning and connection, and which highlighted the power that individuals possessed to shape their own consciousness and choose their own path through life. This new perspective, **humanistic psychology**, focuses on the unique aspects of each individual human, each person's freedom to act, his or her rational thought, and the belief that humans are fundamentally different from other animals.
- Humanistic psychologists sought to understand the meaning of personal experience. They believed that people could attain mental well-being and satisfaction through gaining a greater understanding of themselves, rather than by being diagnosed with a disorder or having their problems labelled.
- **The Brain and Behaviour:**
- Donald Hebb (1904–1985), a Canadian neuroscientist, observed that when a brain cell consistently stimulates another cell, metabolic and physical changes occur to strengthen this relationship.
- This theory, now known as Hebb's Law, demonstrated that memory is actually related to activity occurring at the cellular level. It also reinforced the notion that behaviour can be studied at a number of different levels ranging from neurons (brain cells) to the entire brain.
- Wilder Penfield (1891–1976) was able to map out to the functions of various brain regions. To do this, Penfield electrically stimulated each patient's brain while the patient was awake and conscious. The patient was then able to report the sensations he experienced after each burst of electricity. Based on several patients' reports, Penfield was able to create precise maps of the sensory and motor (movement) cortices in the brain.
- **The Cognitive Revolution:**
- Although behaviourism dominated psychology in the United States and Canada throughout the first half of the 20th century, the view that observable behaviours were more important than thoughts and mental imagery was not universal.
- In Europe, psychologists retained an emphasis on thinking, and ignored the North Americans' cries to study only what could be directly observed.
- It was the work of European psychologists that formed the basis of the cognitive perspective.

- Early evidence of an emerging cognitive perspective concerned the study of memory. British psychologist Frederick Bartlett (1886–1969) found that our memory was not like a photograph.
- Another precursor to cognitive psychology is **Gestalt psychology**, an approach emphasizing that psychologists need to focus on the whole of perception and experience, rather than its parts. This contrasts with the structuralist goal of breaking experience into its individual parts.
- **Cognitive psychology** is a modern psychological perspective that focuses on processes such as memory, thinking, and language.
- **Social and Cultural Influences:**
- **Social psychology** is the study of the influence of other people on our behaviour.
- **Personality psychology** is the study of how different personality characteristics can influence how we think and act.
- Although it's easy to think of social psychology (the effect of external factors) and personality psychology (the effect of internal traits) as being distinct, in reality, your personality and the social situations you are in interact. This relationship was most eloquently described by Kurt Lewin (1890–1947), the founder of modern social psychology. Lewin suggested that behaviour is a function of the individual and the environment. What Lewin meant was that all behaviours could be predicted and explained through understanding how an individual with a specific set of traits would respond in a context that involved a specific set of conditions.
- **Comparing Cultures:**
- **Cross-cultural psychology** is the field of psychology that draws comparisons about individual and group behaviour among cultures.
- **The Neuroimaging Explosion:**
- Although it has been possible to detect brain activity using sensors attached to the scalp since the late 1920s, the use of brain imaging to study behaviour became much more common in the early 1990s.
- It was at this time that a technique known as functional magnetic resonance imaging (fMRI) was developed. fMRI allows us to reliably detect activity throughout the entire brain and to depict this activity on clear three-dimensional images.
- Initially, fMRI was used to examine relatively straightforward behaviours such as visual perception. However, it quickly became the "go to" tool for researchers interested in understanding the neural mechanisms for cognitive behaviours such as memory, emotion, and decision-making. This field, which combines elements of cognitive psychology and biopsychology is known as **cognitive neuroscience**. Cognitive neuroscience examines how different brain areas are involved with different cognitive abilities.
- As fMRI became accessible, researchers in other fields of psychology began to incorporate it into their studies. Psychologists studying social behaviours ranging from racism to relationships use fMRI in their experiments. This new field is known as **social neuroscience**.

- **The Search for the Positive:**
- Another rapidly growing area of psychology involves promoting human strengths and potentials. Rather than focusing on pathologies or negative events such as rejection, the goal of **positive psychology** is to help people see the good in their lives by promoting self-acceptance and improving social relationships with others. The eventual goal of this field is to help people experience feelings of happiness and fulfillment.

Definitions:

- **Behaviourism:** An approach that dominated the first half of the 20th century of North American psychology and had a singular focus on studying only observable behaviour, with little to no reference to mental events or instincts as possible influences on behaviour.
- **Biopsychosocial model:** A means of explaining behaviour as a product of biological, psychological, and sociocultural factors.
- **Cartesian Dualism:** The belief that humans are part machine but we also have a soul, which connects with the body at the pineal gland.
- **Clinical psychology:** The field of psychology that concentrates on the diagnosis and treatment of psychological disorders.
- **Cognitive neuroscience:** Examines how different brain areas are involved with different cognitive abilities.
- **Cognitive psychology:** A modern psychological perspective that focuses on processes such as memory, thinking, and language.
- **Cross-cultural psychology:** The field of psychology that draws comparisons about individual and group behaviour among cultures.
- **Determinism:** The belief that all events are governed by lawful, cause-and-effect relationships.
- **Empiricism:** A philosophical tenet that knowledge comes through experience.
- **Evolutionary psychology:** An approach that interprets and explains modern human behaviour in terms of forces acting upon our distant ancestors.
- **Functionalism:** The study of the purpose and function of behaviour and conscious experience. This contrasts structuralism.
- **Gestalt psychology**: An approach to psychology emphasizing that psychologists need to focus on the whole of perception and experience, rather than its parts. This contrasts with the structuralist goal of breaking experience into its individual parts.
- **Hypothesis:** A testable prediction about processes that can be observed and measured.
- **Humanistic psychology**: A field of psychology that focuses on the unique aspects of each individual human, each person's freedom to act, his or her rational thought, and the belief that humans are fundamentally different from other animals.
- **Medical model:** The use of medical ideas to treat disorders of emotions, thought, and behaviour.
- **Personality psychology:** The study of how different personality characteristics can influence how we think and act.

- **Principle of parsimony:** A theory that the simplest of all competing explanations of a phenomenon should be the one we accept.
- **Psychoanalysis:** A psychological approach that attempts to explain how behaviour and personality are influenced by unconscious processes.
- **Psychology:** The scientific study of behaviour, thought, and experience, and how they can be affected by physical, mental, social, and environmental factors.
- **Psychophysics:** The study of the relationship between the physical world and the mental representation of that world.
- **Psychosomatic medicine:** The branch of medicine that studies and treats disorders in which physical symptoms are influenced by psychological factors.
- **Scientific literacy:** The ability to understand, analyze, and apply scientific information.
- **Scientific method:** A way of learning about the world through collecting observations, developing theories to explain them, and using the theories to make predictions.
- **Social psychology:** The study of the influence of other people on our behaviour.
- **Structuralism:** An attempt to analyze conscious experience by breaking it down into basic elements, and to understand how these elements work together.
- **Theory:** An explanation for a broad range of observations that also generates new hypotheses and integrates numerous findings into a coherent whole.
- **Zeitgeist:** A general set of beliefs of a particular culture at a specific time in history.