Psychology intro:

- Scientific study of the mind and behaviour
- Provides an understanding of how humans operate, and why we behave and think the way we do.
- **Behaviour:** direct observable actions and responses.
- **Mind:** measure internal states and processes, biological and cognitive approaches, includes multi- disciplinary approaches.

Critical Thinking

- **Monism:** the belief that ultimately the mind and the brain are the same.
- **Dualism:** the view that the mind and body function separately.
- **The mind- body problem:** the problem of explaining how mental states is related to physical states, given that the human body is a physical entity, and the mind is non- physical. This has loosely transformed into a search for the neural correlated of consciousness.
- **Phrenology:** The detailed study of the shape and size of the cranium as a supposed indication of character and mental abilities
- **Behaviourism:** emphasises environmental control of behaviour through learning.
- Behaviour is determined by prior learning experiences and stimuli in current environment.
- **Behaviour modification:** decreasing problems behaviours and increasing positive behaviours by manipulating environmental factors.
- **Psychodynamic theory:**
  - relates the psychological forces that underlie human behaviour, feelings, and emotions to early experience.
  - emphasises dynamic relations between conscious motivation and unconscious motivation.
- The **id** is the unconscious reservoir of libido, fuel instincts.
- The **ego** serves as the general manager of personality, decision making.
- The **superego** refers to the repository of an individual's moral values.
- **Cognitive psychology:** the study of how mental processes influence behaviour and how the brain is an information processer.
- **Modern cognitive perspective:** concerned with reasoning, decision making, perceptions, language, problem solving, etc/ uses measures of performance and ability to understand mental processes and systems.
- **Biological perspective:** how brain processes and other bodily functions regulate behaviour.

COGNITION

- Cognition includes multiple components:
  - Perception and Attention: helps us encode information (bring info into the brain from outside world).
  - Memory: Store that info
  - Planning, reasoning, decision making: retrieve and use stored info to guide actions and make choices.

Attention

- Umbrella term for many different processes- all of them relate to how we selectively focus on certain aspects of our environment or internal thoughts, often at expense of others (we ignore other things around us without meaning to)

- Example of **automaticity** – a process becomes so well-practiced that it requires minimal conscious attention. Driving a familiar route without remembering the journey. Despite no conscious recollection, attention guided behaviour successfully**.**

Inattentional Blindness

Inattentional Blindness is the failure to notice a fully visible but unexpected object because attention is engaged in another task.

Why Is This Important?

- It's not that people don't look at the unexpected item (bear); they do. The issue is with their brain's processing—they don't perceive the item, even though their eyes are fixated on it.
- Demonstrates that we do not process all visual information in our environment, even when it's in plain sight.
- We often believe we take in "everything", but attention is selective and constrained**.**

Why it Happen?

Hypothesis: Maybe participants' eyes never looked at the bear**,** because their gaze was tracking the white-shirt players and ball.

Eye Tracking Research:

Eye tracking = technology that records where on the screen the viewer is looking**.** Provides objective data on attention allocation and helps distinguish between seeing and noticing**.**

Eye tracking tells researchers:

- What caught your attention (because your eyes stopped there).
- Whether you looked at something you missed noticing — helping them see if it was a problem of not looking or of not processing what you looked at.

Inattentional blindness *implications:*

- Driving while distracted (e.g., texting or changing music) can lead to potentially dangerous situations where people fail to notice important things, such as pedestrians or traffic signs.

This phenomenon shows that attention is ***limited****, and we can miss large, important things if we are preoccupied with another task.*

Change Blindness:

- Change blindness is when **significant changes in an environment** go unnoticed, even though they are in plain sight.
- Common demonstration: when an image flickers back and forth, and a change is made in one of the scenes. People often fail to notice the change until it is pointed out.
- This is different from inattentional blindness, which is about missing an item while focusing on something else. Change blindness: you miss a change in something you're already looking at, often due to a quick flicker or distraction, because our brain **fails to update** our mental representation of an image when a change occurs.

Illusions of Attention:

- It often **feels** like we're processing everything in our environment, but we miss **a lot.** The feeling of being aware of everything is an **illusion.**

Feature Integration Theory

- Developed by Anne Treisman, it explains how our **attention** helps us identify and process information in the world.
- The theory looks at how certain features in our environment **automatically** grab our attention (like colour or shape) and how other features require **more effort** to be processed.

Sample from brain chapter:

How Neurons Communicate: Synapses

- **Synapse**: The gap between two neurons where communication happens.
- **Pre-synaptic neuron**: The neuron sending the message.
- **Post-synaptic neuron**: The neuron receiving the message.

Neurons are surrounded by fatty membranes**,** just like other cells. These membranes protect the insides of your neurons from the watery environment of the cerebrospinal fluid (CSF) — a kind of salty water that cushions and protects the brain

Your brain floats in CSF inside your skull. When you move your head, your brain follows that motion, lagging slightly due to the fluid. This is why helmets are essential — a sudden stop (like in a crash) can cause your brain to hit the inside of your skull, causing damage even if the skull isn't fractured.

Why Neurons Need to Communicate

A single neuron on its own can't do much. But when neurons communicate — when they send and receive electrical and chemical messages across synapses — that's when complex processes like thinking, memory, perception, and emotion become possible.

Neurons communicate in a multi-step process:

1. The neuron's outer wall is made of fat--controlling which ions can move in or out of the cell. Resting membrane- the membrane only lets more positive ions leave than enter, so the inside of cell becomes more negative than the outside (about -70 millivolts)- meaning that there's a tiny electrical charge (waiting to be used- means the neuron is ready to send a signal but hasn't yet)
2. Excitatory and inhibitory messages from other neurons (received via dendrites) change resting potential. If enough excitatory messages are received, resting potential will exceed a threshold of about -55 mv.
   In easy words: Neurons rest at about -70 mV, meaning they're inactive but ready. When they receive excitatory ("go") and inhibitory ("stop") signals from other neurons, these signals change that voltage. If the excitatory signals are strong enough to raise it to -55 mV (the threshold), the neuron fires and sends its own message.
3. This initiates a rapid depolarisation (electrical charge across a cell membrane, making the inside of the cell less negative (more positive) than its resting state) at the **axon hillock** (region of the neuron located where the **soma (cell body)** transitions into the **axon**. It's the **critical decision point** that determines

whether an action potential will fire), changing membrane potential from around -55 mV to +40mV, which creates a current called an action potential.

- An action potential is an electrical signal generated by the rapid movement of ions across the neuron's membrane. It refers to putting stored energy (the resting potential) into action. This is how neurons send messages down their axons to communicate with other neurons (post-synaptic neurons).