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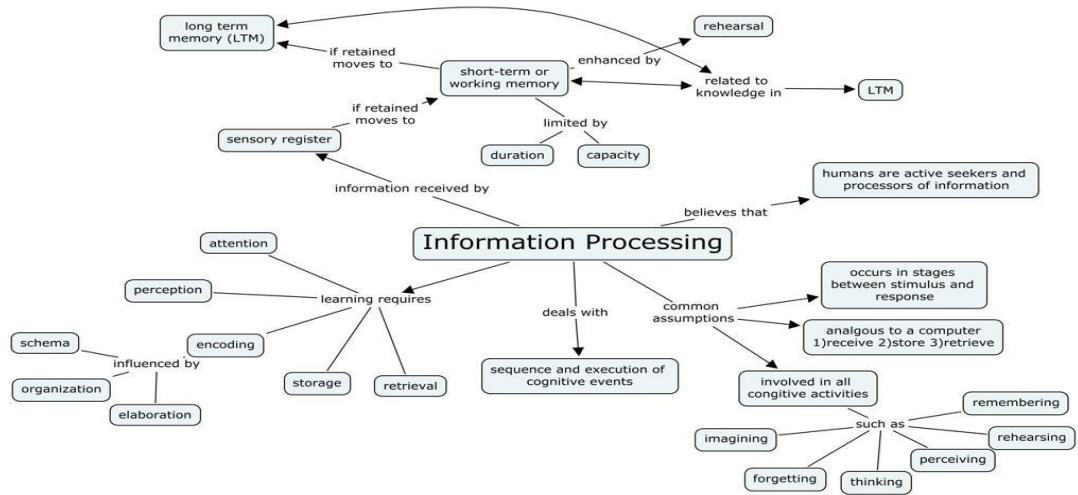
5.2 Notes

IB SEHS

### 5.2 Information processing

- When we perform skills we do so in environments of varying complexities.
- Open skills in particular are \_\_\_\_\_ in very complex environments. Just think about games like soccer and field hockey: 22 players, 1 referee and 2 assistants (soccer) or 2 referees (field hockey), the ball, the goals, the line markings, the \_\_\_\_\_ and the coaches.
  - The players have to take all of this into \_\_\_\_\_ when performing.
- Just how we humans can do this has \_\_\_\_\_ psychologists for many years.

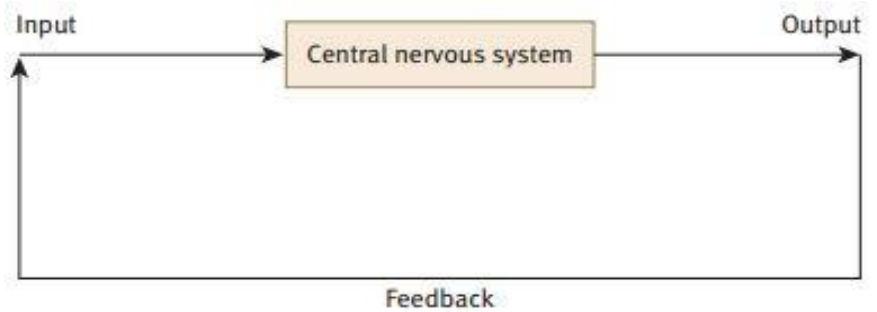
#### Mind Map Example



#### 5.2.1 Describe a simple model of information processing

- The \_\_\_\_\_ refers to the environment that the performer can see, hear and feel.
  - It is sometimes called the display and sometimes the \_\_\_\_\_.
    - In fact, in sport it is very \_\_\_\_\_ one stimulus but several stimuli
- The \_\_\_\_\_ is what the performer did.
  - This is also often referred to as the response.

#### The Black Box Model of information processing



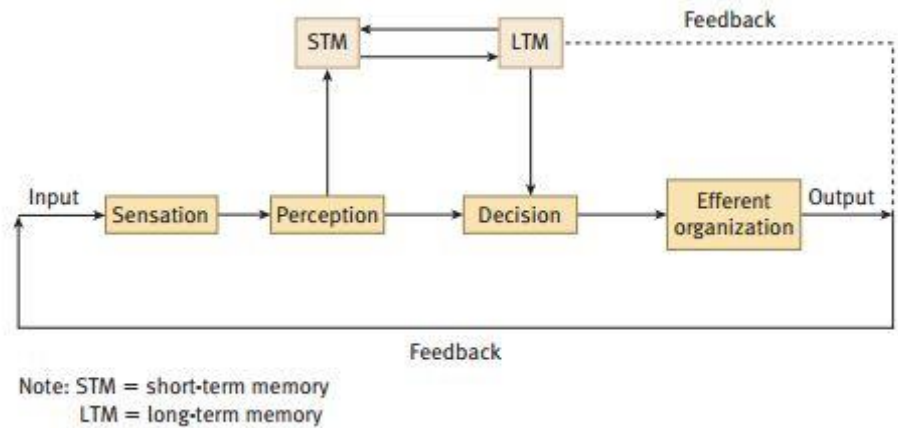
Using a skill of your choice, explain what happens at each stage.



### 5.2.2 Describe Welford's model of information processing

- One of the first researchers to try to explain what actually happens in the CNS when processing information was AT Welford

\_\_\_\_\_ organization – organizing a reaction starting from the brain and extends outward (whatever part/s of the body are carrying out the output response).



- Welford's model suggests that we:
  - Take in \_\_\_\_\_ through our senses and temporarily store all of these inputs prior to sorting them out (sensation)
  - The inputs that are seen as relevant to the \_\_\_\_\_ are then stored in the short-term memory (perception)
  - A decision is made by comparing the information in the short-term memory with previous experiences stored in the long-term memory
  - With reference to the \_\_\_\_\_ term memory for the required action the decision is carried out (decision)
  - The action and the results are stored for future \_\_\_\_\_
  - The whole process then begins again

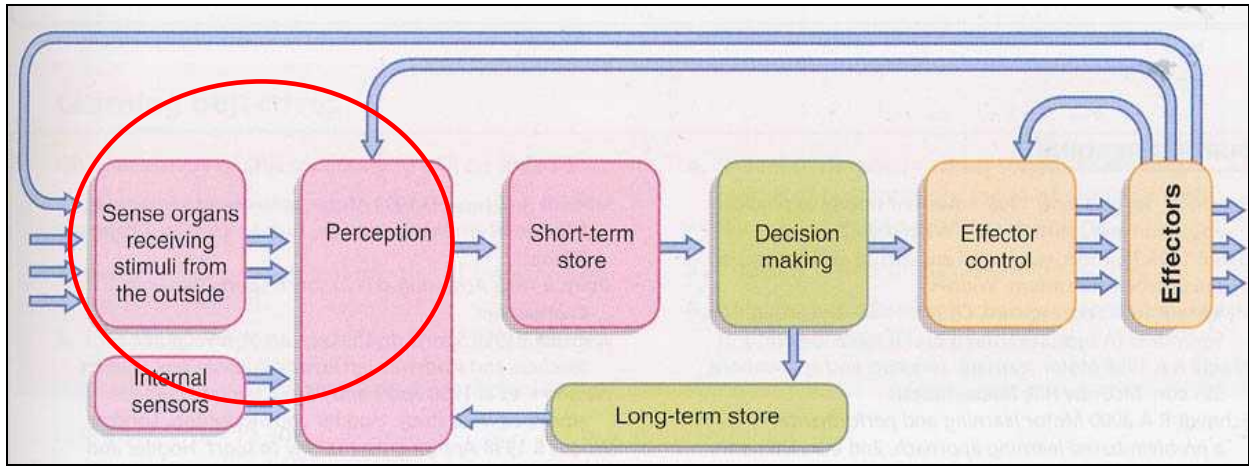
### 5.2.3 Outline the components associated with sensory input

- Sensation or sensory input
  - The senses are responsible for \_\_\_\_\_ information about the environment to the brain.
  - This information is then \_\_\_\_\_ by the brain based on past experiences of similar situations, and is held in the long-term memory (LTM).
  - The senses can be \_\_\_\_\_ into **exteroceptors and interoceptors**.
    - **Exteroceptors** provide information from \_\_\_\_\_ of the body.
      - The main exteroceptors involved in \_\_\_\_\_ with regard to sport are vision and audition
        - Sensory nerve end receptors/sense organ that respond(s) to external light/sound/odour/tactile stimuli;
        - Located in the skin/oral cavity/eyes/ears/nose
    - **Interoceptors** provide information from within the body, information about body position and the \_\_\_\_\_ of limbs.

- The main \_\_\_\_\_ involved in sport are the vestibular apparatus, which provides information about balance; and joint receptors, muscle spindles, which provide information about limb positions.
  - Neuromuscular receptors that register stimuli such as stretch/tension/movement /sensory nerve receptors / awareness of body position in space; **(PROPRIOCEPTORS!!)**
  - Located in the \_\_\_\_\_/tendons/joints/inner ear;
  - \_\_\_\_\_ nerve end receptors; located in the lining of the mucous membrane of the respiratory and digestive tracts/internal visceral organs/vascular system/blood vessels (blood pH)/chemoreceptors/nociceptors (free nerve endings in most body tissues that respond to potentially damaging stimuli/pain)

#### 5.2.4 Explain the signal-detection process

- A researcher named Swets (1964) theorized that individuals receive over **100,000 pieces of information per second**.
  - This may be information from the \_\_\_\_\_ and/ or from within the person themselves.
  - Thus actually perceiving an important piece of information, what he called a “signal”, is problematic.
  - In order to explain how we do this, Swets developed the **signal \_\_\_\_\_ theory**.
- Swets termed the background, non-essential information “noise”.
  - This may mean actual noise, e.g. the sound of spectators, but **covers all information** that is not part of the \_\_\_\_\_.
  - So noise can be **visual or from within yourself** such as worrying about failing.
  - **According to signal detection theory, the probability of detecting any given signal depends on the intensity of the signal compared to the intensity of the background noise.**
- The likelihood of detecting the signal would depend on the \_\_\_\_\_ between **two variables, d-prime (d') and the criterion (C)**.
  - **d' represents the individual's sensitivity to that particular signal.**
    - This sensitivity may depend on the \_\_\_\_\_ of the person's sense organs, e.g. eyes, vestibular apparatus.
    - It may also depend on experience, e.g. familiar signals are thought to be more readily detected than unfamiliar stimuli.
  - **C represents the effect of a person's bias on detection.**
    - C is thought to be affected by arousal level, which in turn affects the \_\_\_\_\_ of the detection of a signal.
    - When arousal is low the signal is missed, what we call an error of omission.
    - If, however, arousal is high the person will have a \_\_\_\_\_ degree of detection (heightened awareness).



- **Perception is the process by which the brain makes sense of the stimuli received**
  - Short-term \_\_\_\_\_ stores large amounts of information for a very short time
    - Selective attention looks out for \_\_\_\_\_ stimuli;
  - Selected stimuli compared to long term memory to select the appropriate response
- Perception is the \_\_\_\_\_ by which the brain interprets and makes sense of the information it is receiving from the sensory organs *e.g.* the height of the server's ball toss;
  - The senses, which are the most important in the perception of information \_\_\_\_\_ in the environment, are visual and auditory receptors;
    - Vision is generally considered to be the most important of the \_\_\_\_\_.
  - **Perception consists of detection, comparison and recognition (DCR)**
    - \_\_\_\_\_ is the process by which the brain identifies that a stimulus is present
- Examples of the stimulus are the spin of the ball/the flight path of the ball/the position of the ball from ball toss relative to the server;
  - Stimulus stands out from the \_\_\_\_\_ noise/those aspects of the display that are not directly relevant to receiving service *e.g.* the color of the server's socks;
  - Early signal **detection** / perceive a signal from only partial information / pattern recognition *e.g.* early detection of the spin of a curveball;
    - \_\_\_\_\_ signal detection by selective attention (block out irrelevant stimuli)
    - Selective attention can be improved through learning from past experience
  - **Comparison** – the \_\_\_\_\_ is passed through the memory and compared with similar codes stored in the memory *e.g.* from previous serves in this match or even from previous matches with the same opponent;
  - **Recognition** occurs when the code of the incoming information \_\_\_\_\_ a code stored in the long-term memory;

### 5.2.5 Distinguish between the characteristics of short-term sensory store, short-term memory and long-term memory

- Another researcher, Tulving (1985), described memory as being the “**capacity that \_\_\_\_\_ organisms to benefit from their past experiences**”.

- In Welford's model he highlights short-term memory (STM) and long-term memory (LTM), but another stage of memory, the sensory information store (SIS) has also been described.
  - All incoming information is held for a brief time in the SIS. Most of the \_\_\_\_\_ is lost within **0.5 seconds**. It is only retained and processed if it is attended to (requires action).
  - If this information is to pass to STM, it must be \_\_\_\_\_. Rehearsal means being attended to, or processed mentally and/or physically

