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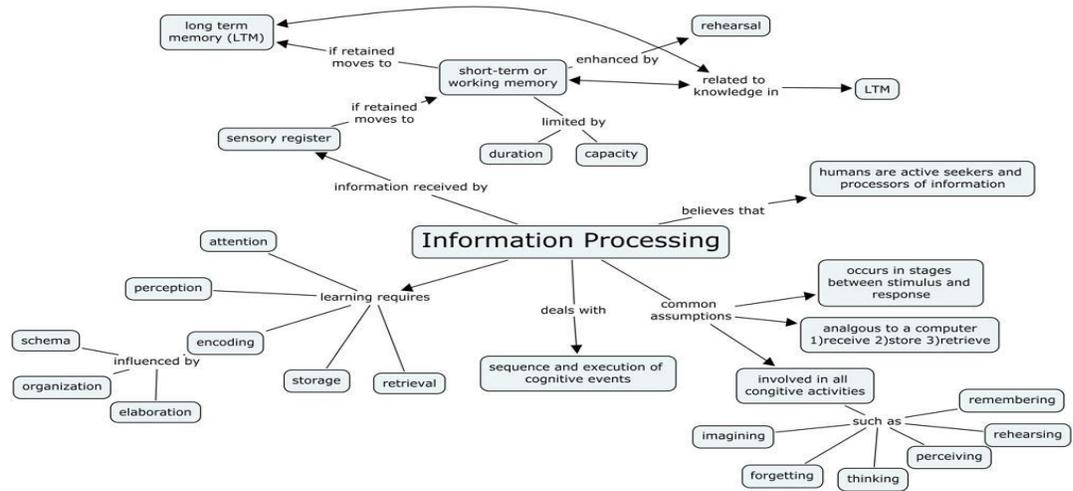
5.2 Notes

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.

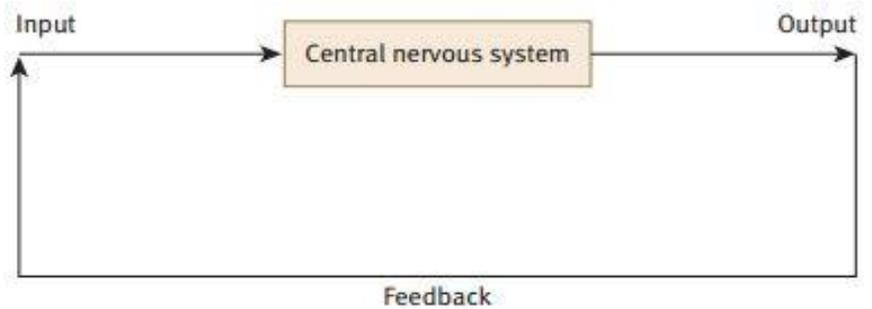
Mind Map Example



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



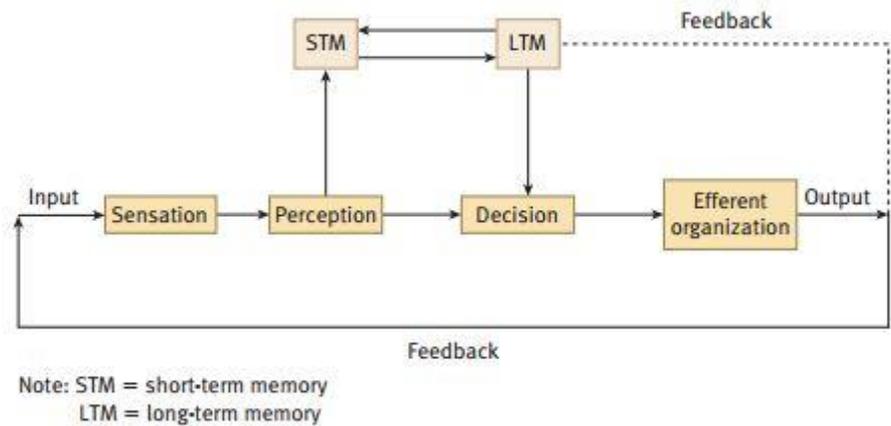
Using a skill of your choice, explain what happens at each stage.



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

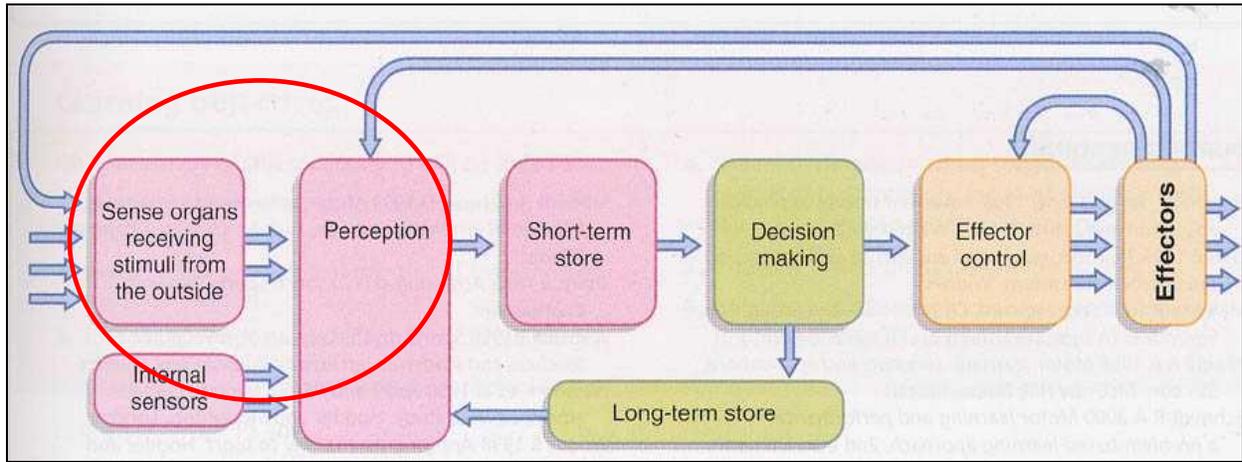
5.2.3 Outline the components associated with sensory input

- 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

