## Human Information Processing

EDS 248

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## Introduction

The work of Piaget, Vygotsky and Tolman laid the foundation for cognitive psychology.

Their work forced Learning Theorists to pay attention to internal mental events (cognitions).

Cognitivism is currently the predominant perspective within which human learning is examined and explained.

## Assumptions

**Like Behaviorism**

Stresses the importance of objective research. Mental events can be inferred from careful designed research. However, others may not know learning has taken place until a behavior is displayed.

**Unlike classical conditioning theorists**

People are actively involved in learning. Not passive responders to external stimuli. Learners make choices.

## Assumptions

**Unlike Behaviorism**

Some learning is unique to humans. All research involves human subjects and is not generalized to other species.

Mental events are the focus of study. Within the individual. Internal not external variables are seen as most important

Learning involves the formation of mental associations that may not always be seen in behavior change. It involves internal mental change.

**Information is not isolated, but rather interconnected.**

**Learning is the process of relating new information to old information.**

## Vocabulary

**Cognitive Processes**

Any mental event, including perception, attention, interpreting, understanding and remembering.

**Learning vs. Memory**

The acquisition of new information vs. The ability to recall information that has been previously learned.

**Storage**

The process by which new information is placed in memory.

**Encoding**

The process by which new information is modified as it is stored.

**Retrieval**

The process through which people find information previously stored.

## An Overview of the HIP Model

There are three basic structures that comprise the HIP model.

They are the **sensory register**, the **working memory**, and the **long-term memory**.

Other important HIP model variables include *acuity, sensation, perception,* and *attention*.

## Sensation/Acuity

The first requirement for information processing is sensation.

Before information can be processed it has to be sensed.

## Sensory Register

1. This structure receives large amounts of information form the senses and for a very brief period of time.
2. Assuming adequate acuity, information is automatically registered as a literal copy of input.
3. If the person does not attend to the sensory input in the sensory register it quickly decays.
   - Visual = less than one second
   - Auditory = 2 to 4 seconds.
4. Information does not move automatically and directly to the working memory. It must be attended to.

## Attention

Refers to the process by which information to be processed (understood) is moved into working memory).

## Perception

1. The person's interpretation of the stimuli.
2. It is effected by a persons basic psychological processes (SLD)
3. Setting influences perception.
   - In situations where you have learned a given stimuli is important, it is more likely to be attended to, processed, and understood.
4. Assumptions influence perceptions.
   - We perceive things as we know them to be. We draw upon our past experiences or background knowledge to interpreted what our senses register.

## Working Memory

1. The place where information currently being attended is stored.
2. The place where the mind operates on information organizes it for storage or discarding, and connects it to other information.
3. Sensory register and long term memory both provide information to the working memory.
4. Often this happens at the same time.

## Working Memory

1. Regardless of input source, data stored in working memory is typically in linguistic form (especially when the task is language based).
2. Rehearsal
   - The longer something is in working memory the more likely it will become a long-term memory.
3. Working Memory Capacity
   - 7 (+/-2).
   - Just as the computers screen - or desktop - is limited in size
   - The bottleneck of the HIP system.
4. Individual Differences in Working Memory

## Long Term Memory

The location where information is kept for a long time.

No known limits

Typically stored in semantic form
Facts and general knowledge

## Summary

- HIP elements

## Activity

- Develop you own visual depiction of the HIP model.

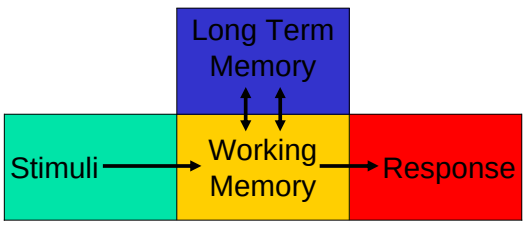
## Example

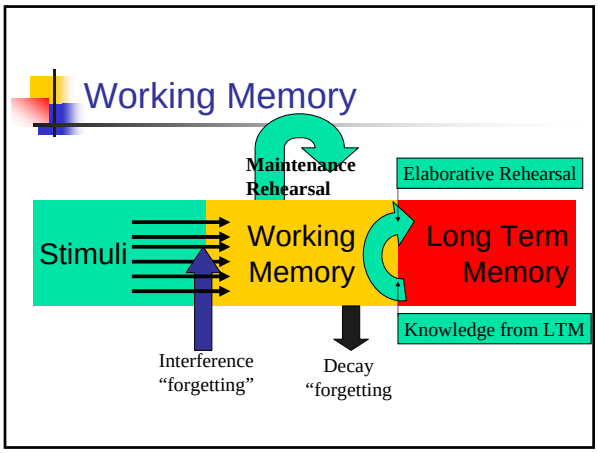
1. Read a social studies text ("The Vikings discovered America").
2. Text/pictures are placed in sensory register.
3. Learner chooses to pay attention to the stimuli.
4. Learner correctly perceives words (acuity & perception) and understands their meaning (long term memory).
   - Information form both the sensory register and long term memory is simultaneously place on the desk top of the HIP system - the working memory.

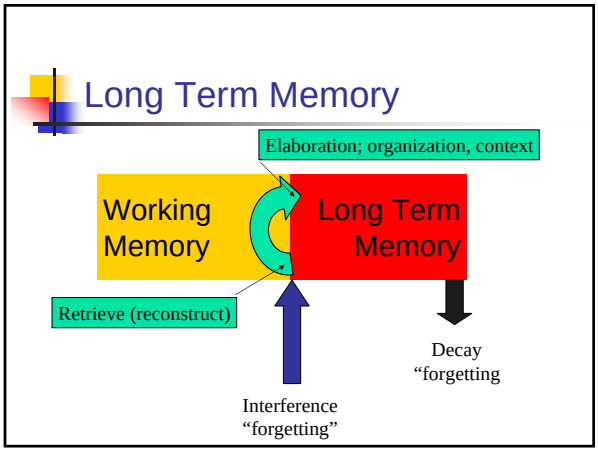
## Example

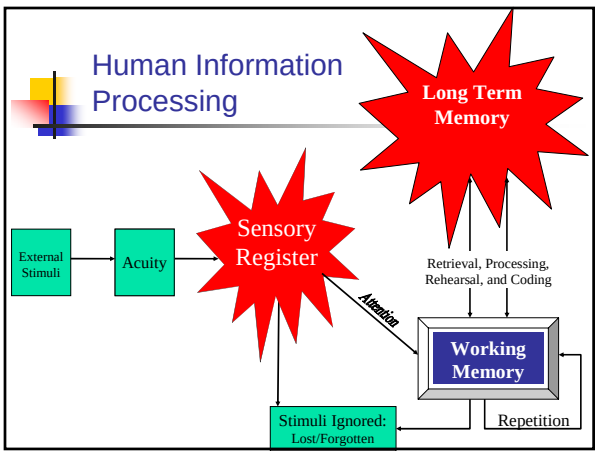
5. Learner continues reading. More words are seen, perceived, and understood. Main ideas are identified. Less important details are discarded (removed from the desk top).
6. Can maintain details long enough to make a note and go on.
7. Access other information from long-term memory to help store new learning (e.g., explorers, Columbus)
8. With rehearsal and coding, the learning may become a never to be forgotten fact.

## Working Memory




Working Memory
Maintenance Rehearsal
Elaborative Rehearsal
Stimuli
Working Memory
Long Term Memory
Knowledge from LTM
Interference "forgetting"
Decay "forgetting


Long Term Memory
Elaboration; organization, context
Working Memory
Long Term Memory
Retrieve (reconstruct)
Decay "forgetting"
Interference "forgetting"


Human Information Processing
Long Term Memory
Sensory Register
External Stimuli
Acuity
Retrieval, Processing, Rehearsal, and Coding
Attention
Working Memory
Stimuli Ignored: Lost/Forgotten
Repetition

## Next Week

- Read Ormrod Chapters 9 & 10
- From readings write & turn-in 4 research/discussion questions (two for each chapter.