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 from 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 person's basic psychological processes (SLD)
   - 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 computer's 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 from both the sensory register and long term memory is simultaneously placed on the desktop 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 desktop).
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
- Stimuli
- Long Term Memory
- Working Memory
- Response
Working Memory

Stimuli

Maintenance Rehearsal

Elaborative Rehearsal

Long Term Memory

Knowledge from LTM

Working Memory

Stimuli Ignored: Lost/Forgotten

Decay “forgetting”

Interference “forgetting”

Retrieval, Processing, Rehearsal, and Coding

Sensory Register

External Stimuli

Acuity

Working Memory

Stimuli Ignored: Lost/Forgotten

Retrieval, Processing, Rehearsal, and Coding

Elaborative Rehearsal

Knowledge from LTM

Working Memory

Maintenance Rehearsal

Decay “forgetting”

Interference “forgetting”

Elaboration; organization, context

Retrieve (reconstruct)
Next Week

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