Introduction - Child's garden of learning

Change in behavior or behavioral propensity induced by experience

Continuum with development - critical periods (vision, language, neuron and synapse elimination in motor neuron, motor system)

Categories of learning

I. Non-associative

Habituation
Sensitization

II. Associative

A. Procedural

1. Classical - Pavlovian - (like with the dog)

Pretest: (US --> R)
(CS -/-> R)

Train: CS + US

Test: CS --> R

Reinforcement - (Biologically relevant stimulus)
2° order conditioning

2. Operant conditioning

Closed loop from environment
Positive feedback

Thorndike Skinner - bar pressing

3. Higher order learning - insight learning, etc.

B. Declarative learning

(H.M. - fact vs. skill, knowing that vs. knowing how)

There are animal models of declarative memory:

1. Monkeys - Mishkin - Delayed non-match to sample

2. Mice -

   a. Morris - Water maze

   b. Context-dependent fear conditioning

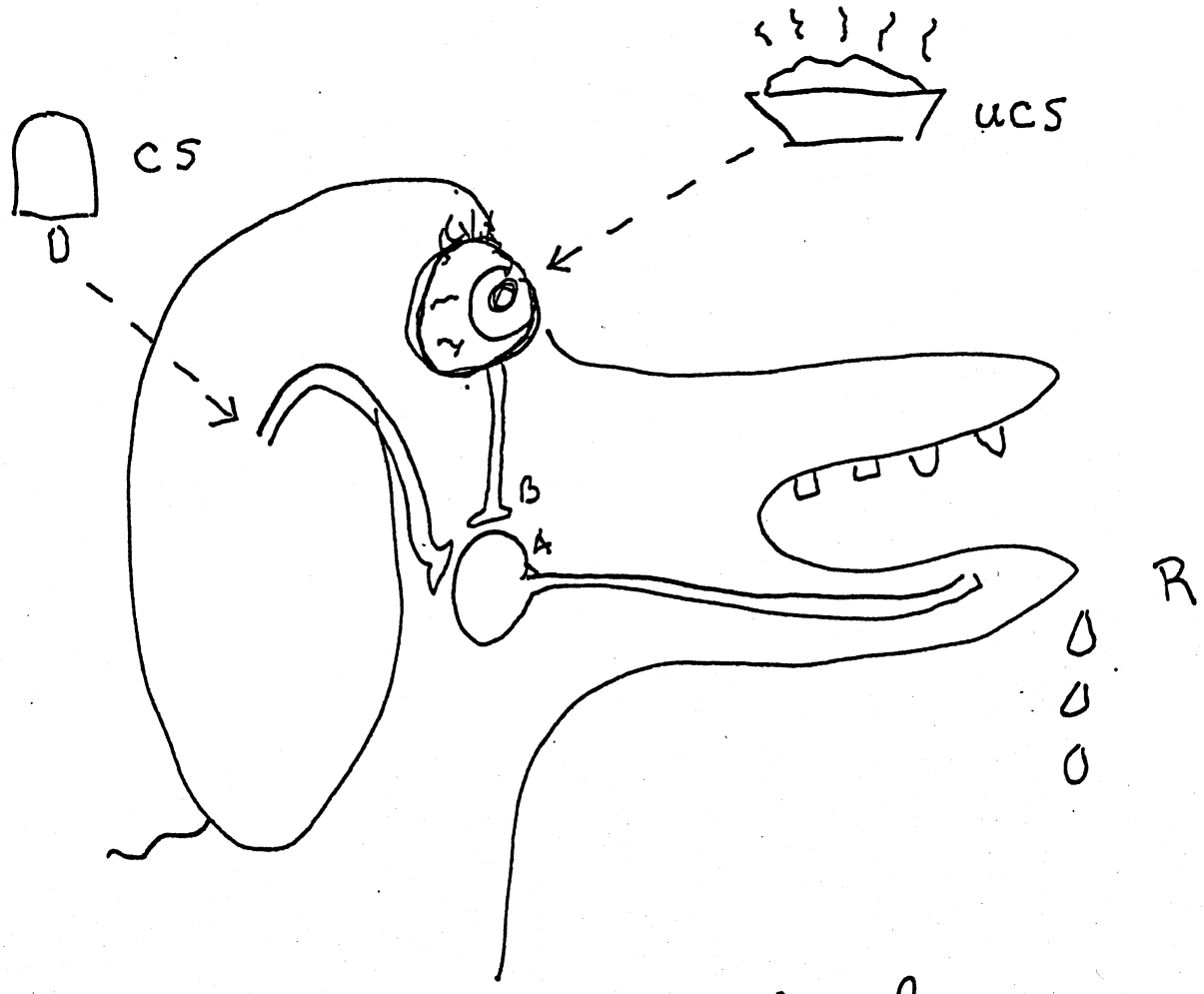
Simplified circuit

Pavlov's dog + Hebbian synapse

Eye (US --> mouth)
BA - functional synapse all the time

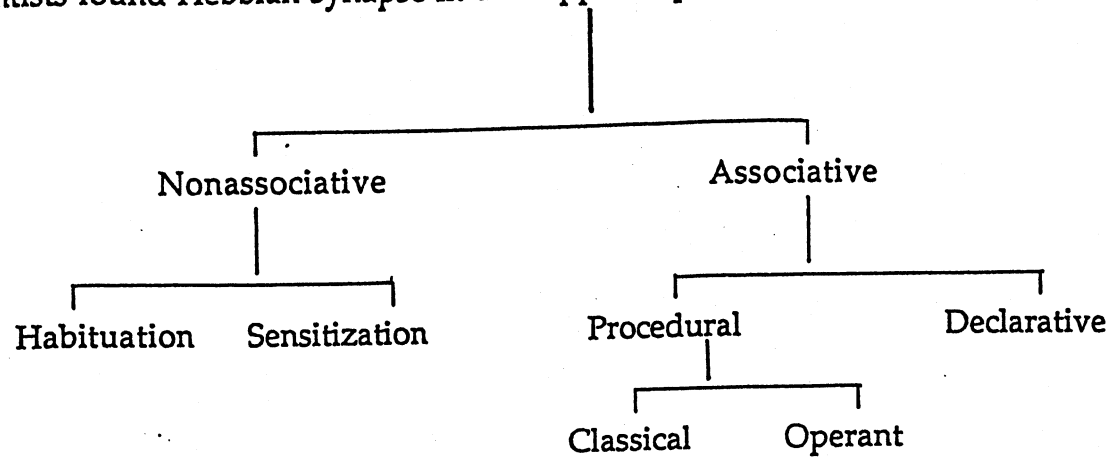
CA
Ear (CS --> mouth)

Hebbian synapse - CA gets stronger if presynaptic input C fires when postsynaptic cell A fires



∃ 2 nonlinear molecules

Scientists found Hebbian synapse in the hippocampus



HM - Declarative memory requires hippocampus and temporal lobes.
Procedural memory does not.

C, **Kinetic issues in learning**

1. Order dependence
   CS and then UCS
   Lack of backwards conditioning

2. Garcia - toxophobic conditioning
   Long-delay learning
   (trace conditioning)

3. Declarative learning - not necessarily order dependent
   NMDA receptor - probably not order dependent

D. **Kinetic issues in memory**

STM --> --> LTM

Three operational definitions of LTM

1. Memory over a day

2. Consolidated memory

   ECS - resistant
   Concussion resistant
   Anesthesia resistant (ARM)

3. Protein systhesis-dependent memory (VLTM)
   Fly mutants and ARM