

## **Biological Constraints on Learning**

Traditional models of learning suggest that all stimuli would be equally good as potential conditioned stimuli and all responses would be equally conditionable.

However, learning occurs under biological constraints.

### **Ecological niche and learning tasks**

#### **Instinctive Drift**

#### **Taste Aversion Learning**

Garcia and Koelling's (1966) "bright noisy water" study

Violations of all-purpose learning principles:

- a. Lack of contiguity between CS and US.
- b. Extremely rapid learning without many trials.
- c. Specific CSs for food aversion.
- d. Novel stimuli (new tastes) are more likely to be associated with illness than old familiar flavors

Opposite to the aversion effect a "**medicine effect**" also exists.

#### **Susan Mineka's Study (1992)**

Humans and monkeys learn snake fears easily than fear of most other stimuli through conditioning, even when the snake stimuli are subliminal.

Humans tend to perceive illusory correlations between snakes and aversive stimuli.

An evolved fear module may exist in the brain.

Even observational learning - learning derived from watching others – requires positing prepared propensities inside the organism.

Without any affects inside the learner being activated by the observed behavior, learning would not occur.

**The Preparedness Dimension:**

The ability to learn is influenced by an organism's biological readiness or predispositions and varies from the most prepared to most contra-prepared.

**Family Size, Birth Order as Constraints of Intelligence**

Belmont and Marolla (1973) Study

Why Might Birth Order Affect IQ?

The Admixture Hypothesis:

The Resource Dilution Model:

The Confluence Model:

**Imprinting and Human Instinct:**

Imprinting: An innate tendency of many aquatic birds in which the young follow the first moving object they see.

Imprinting

- a.
- b.
- c.
- d.

Candidates of Human Instinct:

- a.
- b.
- c.
- d.

## What kinds of tasks would have specially designed mechanisms?

These tasks need to be

- \* important for survival and reproduction
- \* encountered by human ancestors
- \* occurring in evolutionary typical environment (hunters and gatherers society)
- \* enduring and repetitive.

Some candidates of evolutionary typical tasks:

- \*
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- \*

Evolutionary Conditioning:

Repeated survival tasks (Stimuli) →

Possible Responses →

Adaptive or maladaptive consequences →

Natural selection

If an animal has appropriate biases, it learns some things very quickly, at a cost of being unable to learn unlikely combinations.

"Animal species differ in what they can learn, when they can learn it, and how easily they can learn different things" (Alcock, 1975).