Memory Systems and Knowledge

Semantic Memory

Evaluation

- Hierarchical effect
- Typicality effect
- Reverse hierarchical effect
Declarative vs. Procedural Memory

- Procedural memories are difficult to verbalize
- Skills take practice
- Physiological differences

Implicit vs. Explicit Memory
ACT-R

Type-Token Distinction

Properties & Evaluation

• Typicality effect
• Fan effect
Parallel Distributed Processing
AKA Neural Nets
AKA Connectionism

\[ Y = \sum_{i} w_{ij} x_{i} \]

http://academic.udayton.edu/gregelvers/psy522/pdp.html

Adjusting Link Weights: Hebb’s Rule

\[ \Delta w_{ij} = e a_{i} a_{j} \]

\[ \Delta w_{ij} \] – Change in link weight between output i and input j

\[ e \] – learning rate (between 0 and 1)

\[ a_{i} \] – activation of output i

\[ a_{j} \] – activation of input j
Adjusting Link Weights:  
**W** Rule  
AKA Widrow-Hoff training rule

\[ \Delta W_{ij} = e \cdot (t_i - a_i) \cdot a_j \]

- \( \Delta W_{ij} \): Change in link weight between input \( i \) and output \( j \)
- \( e \): learning rate (between 0 and 1)
- \( t_i \): training or desired activation of output \( i \)
- \( a_i \): activation of output \( i \)
- \( a_j \): activation of input \( j \)

Properties & Evaluation

- Remembering
- Generalization
- Interference effects