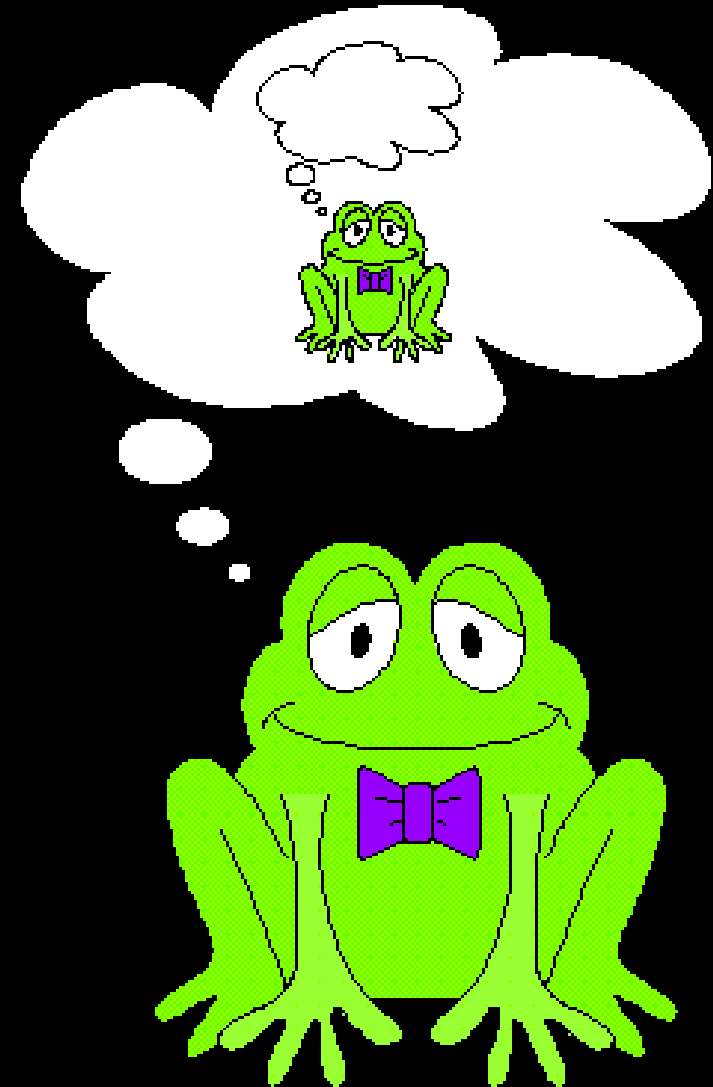# METACOGNITION

Metacognition

- The
  - Knowledge
  - Awareness
  - Control

    of cognitive processes.

Metamemory

- Knowledge of the contents of memory

- Awareness of when you are using memory

- Control of factors when you are using memory

Metamemory

- Under what circumstances does metamemory predict memory performance?
- Under what condition are you sure that you will be able to remember what you learnt?
  - Metamemory item-by-item
  - Metamemory total score

Metamemory: Item-by-item

- Paired Associates given:
  - Disease – Railroad
  - Road – Computer
- 4 conditions:
  - 1 trial 8 seconds
  - 2 trials 4 seconds each
  - 4 trials 2 seconds each
  - 2 trials 4 seconds each, with a test in-between

Metamemory: Item-by-item

- After the last trial:
  - Subjects rated the word pairs in terms of probability of future recall

- Results:
  - Higher ratings were correlated with better recall

Metamemory and Delay

- Metamemory is more accurate with delay.
  - Delay provides accurate judgments about contents of memory that are committed to LTM.

- Practical applications:
  - When making judgments on topics to pay more attention to:
    - wait a while and then make your assessment.

Metamemory and Total-Score

- When people make estimates of their metamemory for the total scores on a test many tend to be overconfident about the scores than being accurate.
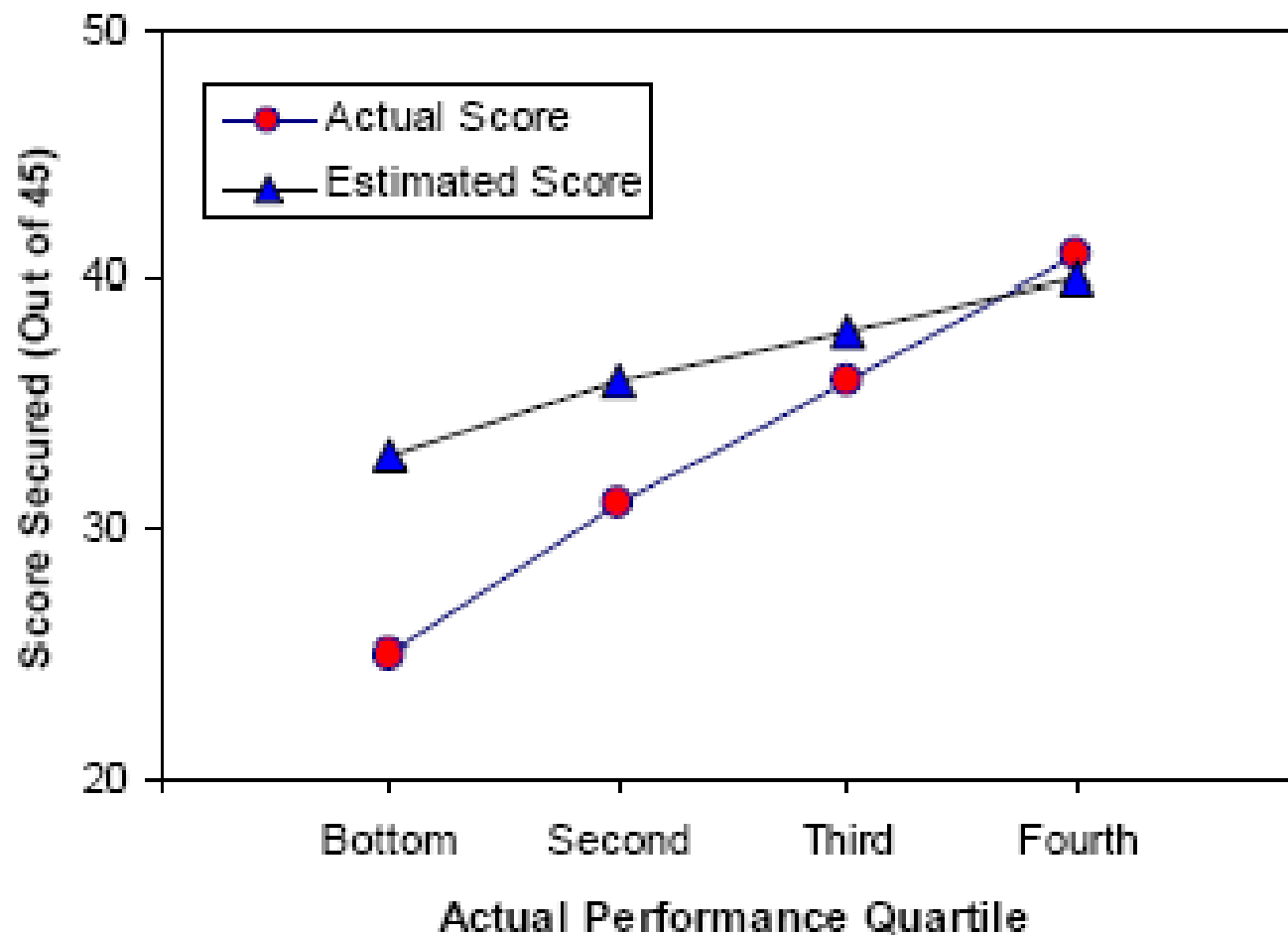
Metamemory and Total-Score Dunning et al 2003

- Estimate score on an exam that you have just finished.
  - The better grades were correlated with better estimations

Results, Dunning et al 2003

Metamemory about Factors Effecting Memory

- Many people are not aware that strategic factors affect their memory performance
  - Metamemory helps us choose the best strategy for ourselves.
  - Trying out a strategy is the best way.

Regulation of Study Strategies

- People are able to decide and allocate more time to material that is more difficult to learn.

- However they do not do it enough
  - People enjoy thinking about familiar topics more

What happens under time pressure?

- When people know there is not enough time to study everything
  - You allocate more time to easy items, than difficult items.

Tip-of-the-Tongue Phenomenon

- Subjective feeling that you know the word and try searching for it but are unable to recall.

- Recall of the word may occur later.

- We experience it more as we grow old.

Brown and McNeill (1966)

- They gave people definitions of uncommon words and asked for the word
  - When the material produced a TOT state they asked them to produce words that sounded similar.
    - First letter match 49%
    - Number syllables match 48%

Feeling-of-Knowing

- Prediction about whether you could correctly recognize the correct answer of a question
  - You cannot recall the answer
  - But you have a feeling that you know it, and can recognize it if it as provided to you

Metacomprehension

- Our thoughts about comprehension.
  - How well did I understand what I heard or read?
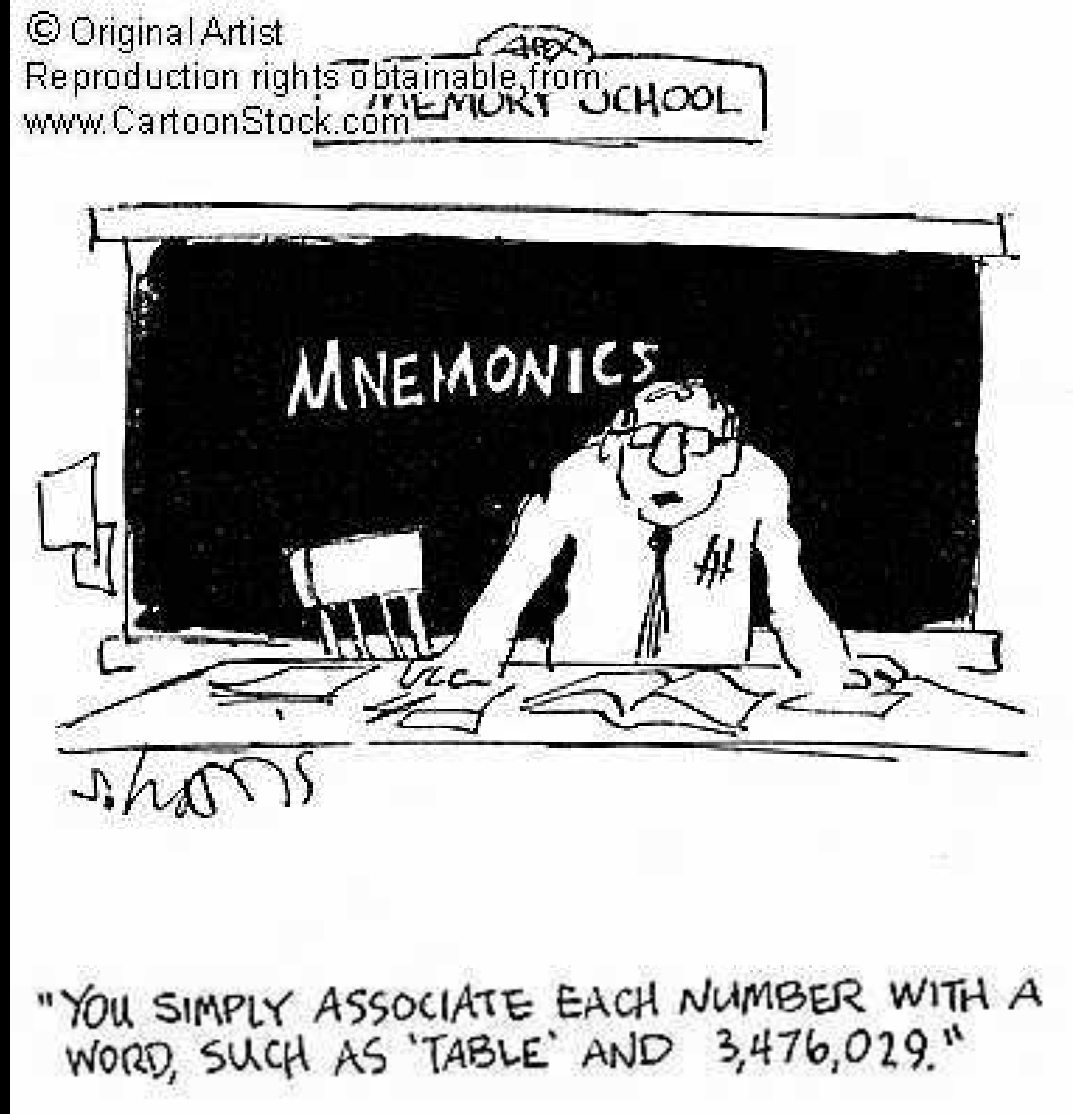 - Important when studying material

Metacomprehension Accuracy

- College student are not very accurate
  - Familiarity is often confused with understanding
  - Overestimate performance on a possible test
- People who are better at metacognition usually are more successful at a later comprehension test
  - r= +.43

Improving Metacomprehension

- Pre-test

- Read - Wait – Summarize

- Deep processing

- Regulation
  - Good readers summarize, visualize and elaborate

MEMORY STRATEGIES

- Mental activities that are designed to improve your encoding and retrieval.

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MEMORY SCHOOL

MNEMONICS

"YOU SIMPLY ASSOCIATE EACH NUMBER WITH A WORD, SUCH AS 'TABLE' AND 3,476,029."

What we already know…

- Levels of Processing
  - Deeper levels and elaborative rehearsal is better
- Encoding Specificity
  - Devise strategies according to the testing method
- Divided Attention
  - Hinders performance

Practice

The more you practice the more you remember

- <u>The total time hypothesis:</u>
  - Amount you learn depends on the total time you devote to learning

Practice

- <u>Distribution of Practice Effect:</u>
  - Better performance for both recall and recognition
  - *Desirable difficulties*
    - When you test your memory after a certain amount of time has passed, then you realize your weaknesses.

Imagery Mnemonics

Mnemonic: use of a strategy that aids memory

- Bower and Winzenz (1970)
  - Paired-associates of concrete nouns
  - 2 conditions
    - Silent repetition
    - Construct a vivid mental image
  - People in the imagery condition recalled twice as many words

Imagery Mnemonics

The Keyword Method:

- Especially useful when learning foreign language vocabulary or jargon or people's names.
  - you link the foreign word with a similar sounding Turkish word and imagine them vividly interacting with each other.
 - EXP?

Imagery Mnemonics

The Method of Loci:

- Associating the things to remember with physical locations

- Useful when order is important
  - Imagine a series of places you know well in order
  - Imagine each item you want to remember
  - Associate each item with a specific location.

Organizational Mnemonics

- Chunking
  - Better memory if information is put into meaningful chunks

- Hierarchy Technique
  - Better memory if material is organized in a hierarchy

Hierarchy Technique
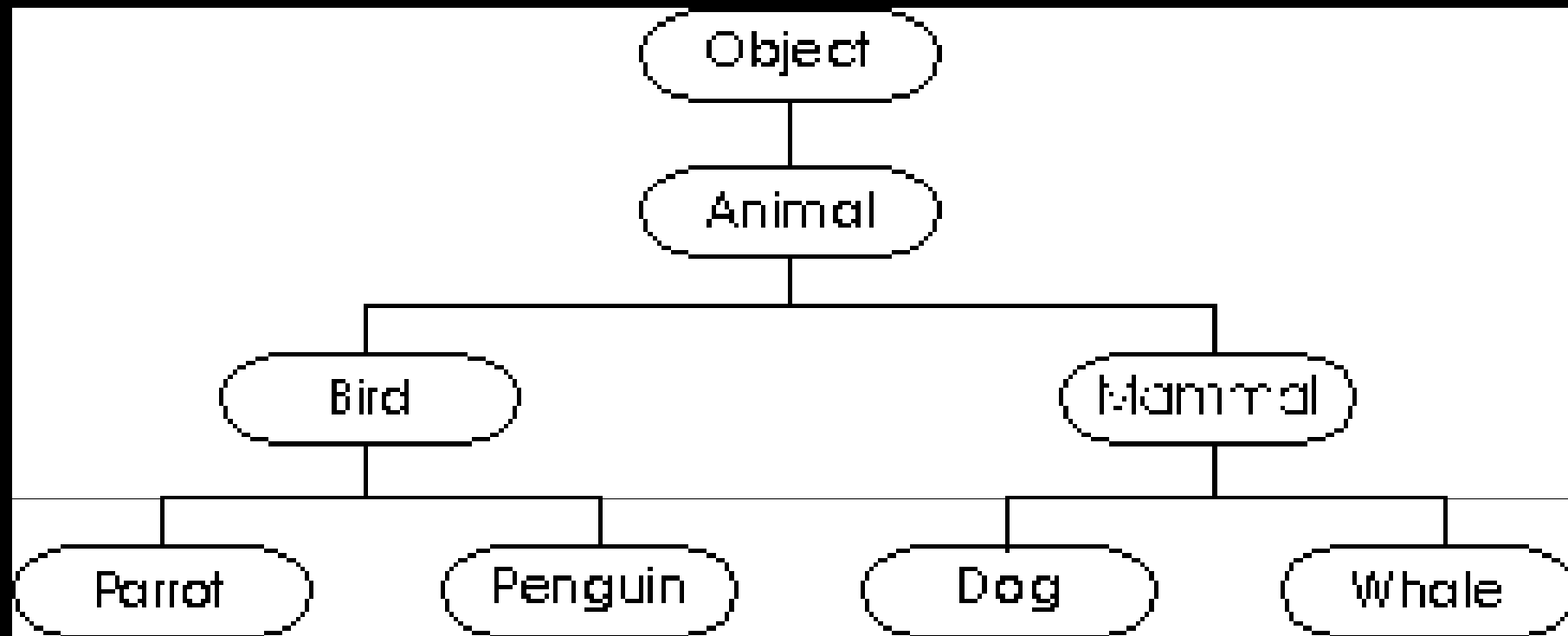
Organizational Mnemonics

- Chunking
  - Better memory if information is out into meaningful chunks
- Hierarchy Technique
  - Better memory if material is organized in a hierarchy
- First-letter Technique
  - ABC
- Narrative Technique
  - Make up a story that links the words together.

Memory Improvement

- There is no single solution to memory problems.
    - Since there is no single memory problem.

- **Multimodal Approach by Herrmann:**
    - Physical condition (sleep, activity level, health…)
    - Psychological well-being
    - Flexible use of different memory strategies.