3-1-imagery
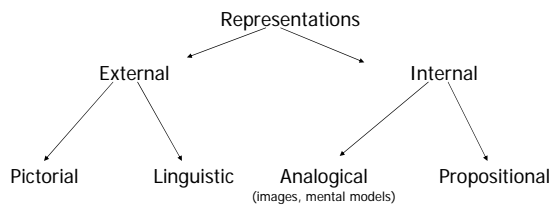

What is a representation?

- Tool for re-presenting
- External world
- Imagination
- Abstract concepts
  - Gene

Taxonomy

Representations

External

Internal

Pictorial   Linguistic   Analogical   Propositional
                                   (images, mental models)

Office Assignment

Mark 118	Kerry 119	Judith 120	Ilona 121
Hallway			
Marc 125	Hank 124	Ingrid 123	No one 122

Mark is in 118

Kerry is in 119

Judith is in 120

Ilona is in 121

Noone is in 122

Ingrid is in 123

Hank is in 124

Marc is in 125

Linguistic and Pictorial Reps

Similar
- Partial
  - Color of carpet?
  - Thickness of walls?

- All representations involve abstraction

Different
- Pictures have a closer relationship to world than language
  - Relative spatial position
- Analogical – structure resembles structure of referent

Language   Picture

"The phone is on the desk."

1. Discrete symbols
2. Explicit symbols for relations
3. Grammatical, rules for combo
4. Abstract, amodal

1. No discrete symbols
2. Implicit
3. No clear rules for combo
4. Concrete, visual modality

Internal Representations:
Propositional   Analogue

- Discrete
- Distinct Symbols
- Combinatorial
- Amodal

- Continuous
- Point-to-Point Mapping
- Share structure w/referent
- Modal
  - Visual
  - Auditory
  - Haptic
  - Olfactory

Propositional Representations

- Explicit, discrete, abstract entities that represent conceptual content
- Predicate Calculus, LISP, Prolog

Predicates(arguments)
Hit(Mary,John,stick)
Hard(stick)

2nd-Order-Preds[Propositions]
CAUSE[Hit(Mary,John,Stick),
Hurt(Mary,John)]

Pavio and Dual Coding

- Two independent, interconnected coding systems
- Encoding, organizing, storing, & retrieving distinct info types
- Nonverbal (imagery) system
  - Spatial information, scene analysis, generating mental images
- Verbal (propositional) system
  - Verbal information, sequential processing
- Sensorimotor subsystems
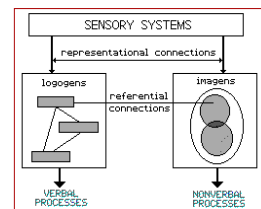
Dual Coding
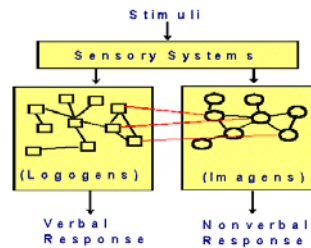
Evidence for Dual Coding

- Free Recall of Words versus Pictures
- Word Imaging and Concreteness
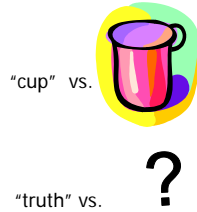- Repetition Effects

Free Recall

- Set of Pictures versus List of Words
- Pictures encoded by both systems
- Memory for pictures better than memory for words

Word Imaging & Concreteness

- Pavio et al. (1968)
  - Rate imagability, concreteness of words
  - Better memory for concrete, imagable words

"cup" vs.

"truth" vs.

?

Word Pair Learning

- Learn lists of word pairs
  - CC (concrete/concrete)
  - AC (abstract/concrete)
  - CA (concrete/abstract)
  - AA (abstract/abstract)
- Out of 16 pairs:
  - CC - 11.4
  - CA - 10
  - AC - 7.4
  - AA - 6.1

- Imagability of the words improved recall
- If the first word was imagable (CA vs. AC) also made a difference
  - The first word acts as a cue for recalling the second word

Repetition Effects

- Show subjects list of concrete nouns, either image or pronounce
  - Probability of imaged words *twice* pronounced
- Repetition Manipulation: image/pronounce, image/image, pronounce/pronounce
  - image/pronounce additive
  - pronounce/pronounce, image/image not

Additive Effects

- Interactive Learning Research (Glasser)
  - Hear 20%
  - See 30%
 - See & Hear 50%

Repetition Effects

- Show subjects list of concrete nouns, either image or pronounce
  - Probability of imaged words *twice* pronounced
- Repetition Manipulation: image/pronounce, image/image, pronounce/pronounce
  - image/pronounce additive
    - Two independent memory codes influence behavior
  - pronounce/pronounce, image/image not
    - Only one memory code active in each case

Relational-Organizational Hypothesis

- Alternative explanation for concreteness effects

- Forming an image makes you create more associations between the things to be remembered and your existing knowledge, giving you more retrieval cues

- Forming images alone doesn't help as much as forming *interacting* images

Concreteness

- Richardson (1980)
  - "Form images depicting objects interacting in some way."
  - Performance improves for concrete materials but not abstract materials

"cup" vs.

"truth" vs. **?**
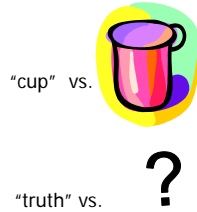
Concreteness or Instructions?

- Bower (1970)
  - Form short phrases including the list of items
  - Concrete (improves) Abstract (doesn't)
- Organization and Cohesiveness Crucial

Concreteness or Instructions?

- Bower
  - Form images depicting objects interacting in some way
  - Form images of two objects separated in space
  - Memorize
- Not just dual encoding, relationships

Instructions	Results
Interactive Imagery	More
Separation Imagery	Equal
Rote Memorization	Equal

Dual Coding Summary

- At least 2 coding systems
  - Free Recall
  - Repetition Effects
  - Concreteness
- Are pictures remembered better?
  - Usually, but not necessarily
  - Analogue Representations promote relational understanding that aids memory