Imagery

Mental imagery can be defined as pictures in the mind or a visual representation in the absence of environmental input

Imagery

- A lot of the mnemonic techniques have an imagery aspect to them, so we will start with a discussion of imagery and memory
- Mnemonic: a system such as a pattern of letters, ideas, or associations which assists in remembering something.

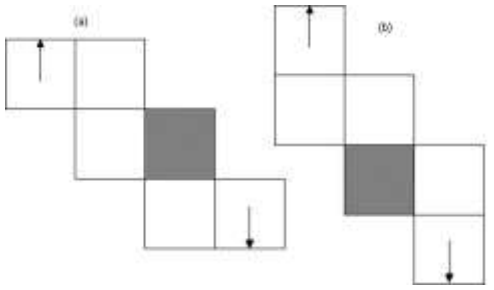
Imagery

- What is a mental image?
  - It is the mental representation of things that are not currently being sensed by the sense organs
    - How is it like reality, how is it different?
    - Hard to study, not directly observable and fade away quickly.
    - Does an image use the same neural hardware as experience?
    - Spatial (relating to space) ability is independent of verbal ability. We can test it using methods similar to operation span or digit span.

Imagery

Example of test:

- Cube folding: Will the arrows touch if you fold these into cubes?

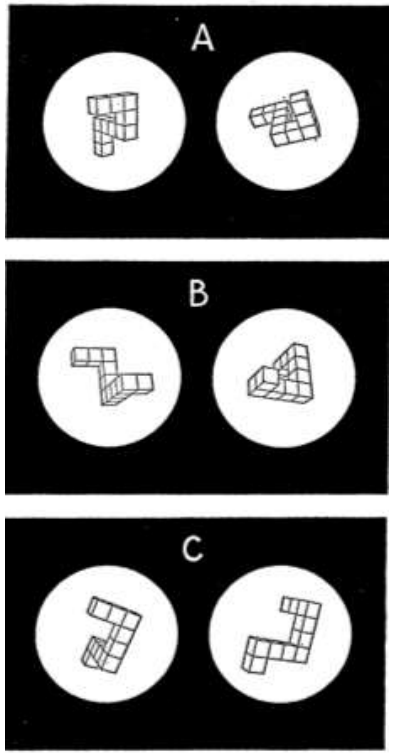


Imagery and Memory Effects

- Mental rotation tasks
- Picture superiority effect
- Image scanning effect
- Bizarreness effect
- Concreteness Effect

Imagery and Memory Effects

- Mental rotation tasks
  - **Mental rotation** is the ability to **rotate mental** representations of two-dimensional and three-dimensional objects as it is related to the visual representation of such **rotation** within the human mind.
  - Mental rotation tasks suggest that you use images in working memory in an ***analog*** (pictures in the head) way.



Imagery and Memory Effects

- Picture superiority effect
  - Shepard (1967):
    - Present 612 pictures or words with a recognition test. After 2 hours approximately 100% accuracy for pictures, 88% for words. After a week about 88% for both.
  - Standing (1977):
    - Learn 1,000 words, 1,000 simple pictures, or 1,000 bizarre pictures. After 2 days recognition memory was 61.5% for words, 77% for pictures, and 88% for bizarre pictures.
  - Summation: Memory for pictures is better than memory for words.

Imagery and Memory Effects

- Image scanning effect
  - Scanning tasks show that the farther apart two things are on an image, the longer it takes to mentally scan from one to the other (e.g., Kosslyn, Ball, & Reiser, 1978).

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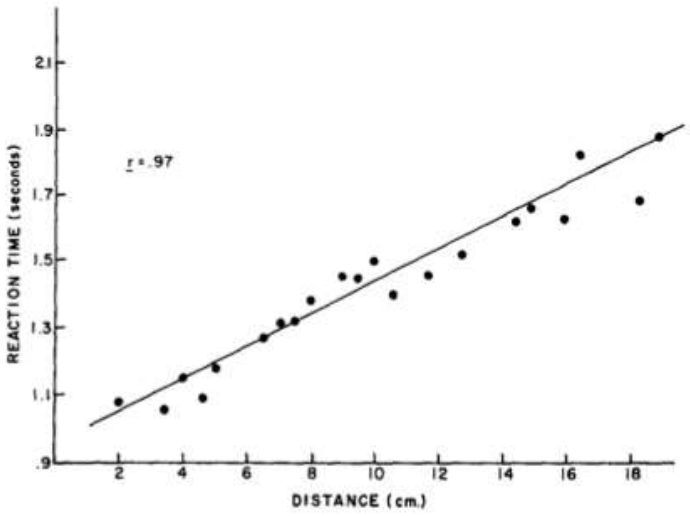

  - Time to scan between all pairs of locations on imaged map

Imagery and Memory Effects

- Bizarreness effect
- Better memory for bizarre images
  - McDaniel & Einstein (1986)
    - Presented participants with sentences, underlined word triplets, within either **bizarre** or **common** sentence contexts (10 sets)
      - Bizarre: The dog rode the bicycle down the street
      - Common: The dog chased the bicycle down the street.
    - Instructions: Form an mental image that included the underlined words, and rate the vividness (intensity) of the image
    - Following a 30 sec distractor task they were asked to recall the underlined words.
    - Results, bizarre images were better recalled than common images
      - But only when in the context of common images
      - Von Restorff effect (isolation effects): The distinctive (or isolated) item "stands out" and is remembered better than other list items

Imagery and Memory Effects

- Concreteness Effect: refers to the observation that concrete nouns are processed faster and more accurately than abstract nouns in a variety of cognitive tasks.
  - Typically better recall for the concrete items

• Dollar	• Justice
• Cabin	• Franchise
• Storm	• Session
• Arrow	• Incident
• River	• Hope
• Book	• Cost
• Peach	• Mood

Imagery

- Images could be:
  - *Analog representations:*
    - *Pictures in the head*: Images are what they feel like, a picture in the head whose properties are like the properties of the real thing
    - *Perceptual processing*: Images use the same perceptual hardware you use to see
  - *Propositions*: It's essentially a verbal/symbolic thing. The feeling that you have an image is epiphenomenal, there isn't really an image

Three Theories of Imagery

1. Functional-Equivalency hypothesis
   - Analog representations. Something like pictures, but not exactly the same
2. Conceptual-Propositional Hypothesis
   - No images, propositional (verbal) representation
3. Paivio's Dual-Coding Hypothesis
   - Perhaps both image and verbal (propositional?) representations for some things

Three Theories of Imagery

1. Functional-Equivalency hypothesis
   - The **functional-equivalency** hypothesis is that **mental images** are "internal representations" that work in the same way as the actual perception of physical objects.
   - Analog representations. Something like pictures, but not exactly the same

Three Theories of Imagery

2. Conceptual-Propositional Hypothesis
   - The propositional **theory** involves storing **images** in the form of a generic propositional code that stores the meaning of the concept not the **image** itself. …
   - No images, propositional (verbal) representation
   - we store propositional interpretations of events, whether they be verbal or visual, rather than the imagery components.

Theories of Imagery

- Images could be:
  - *Propositions*: Essentially a verbal/symbolic thing. The feeling that you have an image is epiphenomenal, there isn't really an image.

You saw 

You heard

"The goal keeper missed the ball"

Same underlying propositional representations:

- missed(goalkeeper, ball)

Image may provide even richer information:

- wept(goalkeeper)
- cursed(goalkeeper)

Three Theories of Imagery

Comparing Analog and Propositional codes

Analog Code

- Picture-like code
- Images like perceptions, retain some sensory qualities
- Simultaneous
- Different representations for each sense

Propositional Code

- Word-like code
- Images are descriptions of visual scenes
- Sequential
- Same representations for each sense

Anderson (1978): concluded that "*it may not be possible to decide between imaginal and propositional representations strictly on the basis of behavioral data*."

Three Theories of Imagery

3. Paivio's Dual-Coding Hypothesis
   - Proposed that words and images are processed separately (based on patients with temporal lobe damage who could not process images).
   - The basic tenant of this theory is that information is mentally represented either in a verbal system or a nonverbal (analog) system (or both).
     - Each system contains different kinds of information.
     - Each concept is connected to other related concepts in the same system and the other system.
     - Activating any one concept also leads to activation of closely related concepts.

Special Abilities

- Eidetic imagery
- Flashbulb memories

Special Abilities

- Eidetic imagery = Photographic memory (the ability to remember information or visual images in great detail).
  - Criteria strict for classification - image = photograph
  - Eidetic images have more detail than normal and last longer than iconic memory.
  - Frequency of occurrence
    - Mostly in preadolescent children (10-13 years of age)
    - Rare in adults - not well-studied

Eidetic imagery

Fig. 9.10 Test picture like that used to identify children with eidetic imagery. To test your eidetic imagery, look at the picture for 30 seconds. Then look at a blank surface and try to "project" the picture on it. If you have good eidetic imagery, you will be able to see the picture in detail. Return now to the text and try to answer the questions there. (Redrawn from an illustration in Lewis Carroll's *Alice's Adventures in Wonderland.*)

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Special Abilities

- Flashbulb memories is a highly detailed, exceptionally vivid 'snapshot' of the moment and circumstances in which a piece of surprising and consequential (or emotionally arousing) news was heard.
  - Very vivid/bright memories
  - Personally relevant – emotion
  - Difficult to study
  - Free from errors

Flashbulb Memory

MCQ

1. What is imagery?

a. interesting dialogue

b. **vivid sensory description**

c. character development

d. both a and c

2. Imagery appeals to the

a. Brain

b. **Senses**

c. Crazy people

d. Memory

3.Studies show that the areas of the brain involved in mental imagery are

a. **not currently being sensed by the sense organs**

b. The most primitive parts

c. Only active in sleep

d. The same ones used in actual perception.

4. Image scanning effect show

a. Nearer the two things, longer it takes to mentally scan

b. Farther the two things, smaller it takes to mentally scan

c. Nearer the two things, smaller it takes to mentally scan

d. **Farther the two things, longer it takes to mentally scan**

5. Imagery Images could be

a. Analog

b. Perceptual process

c. Propositions

d. **All the above**

6. The _____ theory of imagery work in the same way as the actual perception of physical objects.

a. **Functional-Equivalency**

b. Conceptual-Propositional

c. Paivio's Dual-Coding

7. The Analog code is _____ and the propositional code is _____

a. **Picture, Word**

b. Sequential, Simultaneous

c. Word, Picture

8. What is the role of the dual code theory of imagery?

a. The theory suggests that words and images are processed together.

b. Dual code theory of imagery asserts that information is represented either or both in a verbal system and in an analog system.

c. The theory suggests that words and images are processed separately.

d. Both a and b

e. **Both b and c**

9. Special ability are

a. Eidetic and Flashbulb

b. Photographic and Vivid

c. **Both a and b**

10. Flashbulb memory is a highly detailed about the news one heard and include

a. The place of the incident

b. Ongoing activity

c. Own and other's affect

d. Importance of the incident

e. **All of the above**

11. Imagery that hypothesis both image and verbal things are called

a. Functional-Equivalency hypothesis

b. Conceptual-prepositional hypothesis

c. Paivio's dual coding hypothesis

12. Do we use our five senses in imagery: smell, taste, touch, sight, and hearing?

a. **Yes**

b. No

c. May be