


Thinking 1


Representations

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- Mental representations allow us to
 - Think about physical objects that are not immediately present.
 - Consider the outcomes of actions that we are not currently experiencing.
 - Draw conclusions based on evidence from events that we've encountered in the past and so are available only through memory.
 - All of A/B/C
 - None of A/B/C


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Two Important Themes in the Text

- Human are simultaneously capable of
 - extraordinarily high-quality thinking
 - of coming to conclusions that are completely unjustified and making choices that are foolish
- The nature of thought depends critically on what it is that thought manipulates – i.e., ideas
 - and how they are represented


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- A TV satellite weather map that shows cloud cover and the outlines of bodies of water could best be called a(n) _____ representation.
 - mental
 - hypothetical
 - analogical
 - symbolic




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Mental Representation

- Content, in the mind, that stands for some object or event or state of affairs
- Two broad classes of mental representations
 - Analogical Example: Mental Images
 - Symbolic Example: Propositions
- Continuum not a categorical distinction

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- Thinking back to the questions I just asked, rate the vividness of you imagery using this scale.
 - Perfectly Clear and as vivid as normal vision
 - Clear and reasonably vivid
 - Moderately clear and vivid
 - Vague and dim
 - No image at all (only "knowing" that you are thinking of the object)

Scale taken from Kihlstrom, J.F., Glisky, M.L., Peterson, M.A., Harvey, E.M., & Rose, P.M. (1991). Vividness and control of mental imagery: A psychometric analysis. *Journal of Mental Imagery*, 15, 133-142.

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Mental Images & Symbols

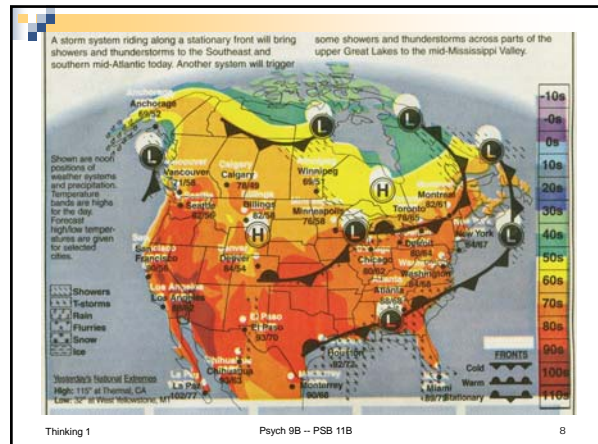


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- What does research on visual imagery indicate?
- A. The same brain areas are involved in visual perception and visual imagery.
- B. People who lose the ability to perceive colors often also lose the ability to imagine colors.
- C. People who lose the ability to perceive fine detail often also lose the ability to see fine detail in visual imagery.
- D. All of the above answers are correct.

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Strengths and Weaknesses of Analogical Representations



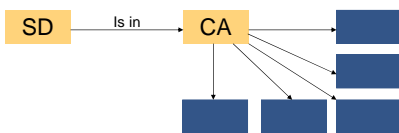
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Symbolic Representations

- More flexible *because* they are arbitrary
- Symbols can be combined to represent more complex ideas: propositions



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- The Sentence Verification Zap that you did two weeks ago, draws heavily on _____ representations.

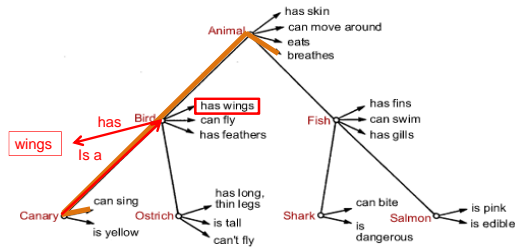
- A. analogical
- B. symbolic

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Sentence Verification Zap



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Consider the sentence "Jane loves Caesar salad."

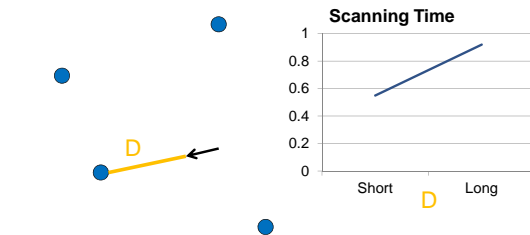
- A. Although this is a sentence, it not a proposition.
- B. Considered as a proposition, 'Jane loves' is the predicate and 'Caesar salad' is the subject.
- C. Considered as a proposition, 'Jane loves' is the subject and 'Caesar salad' is the predicate.
- D. Considered as a proposition, 'Jane' is the subject and 'loves Caesar salad' is the predicate.

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Mental Scanning Zap

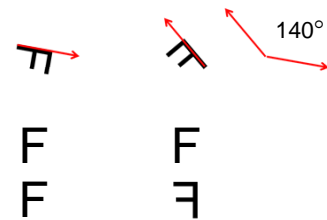


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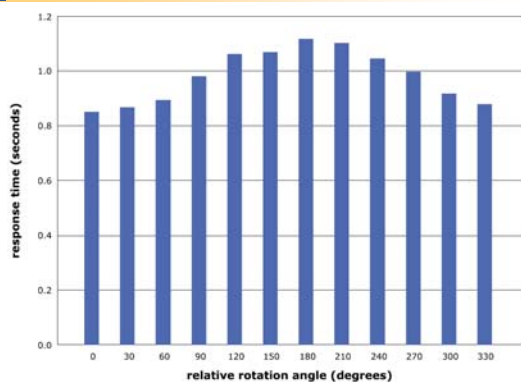
Mental Rotation 2-D Zap



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Transcranial Magnetic Stimulation: TMS

- TMS uses electromagnetic induction to generate, from the outside, currents in the brain up to 1" from the coil
- The induced currents briefly disrupt (10 – 20 ms) normal neural signals
- TMS has been used to show that visual imagery and perception both depend on processing in visual cortex



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Summary: Representations

- We represent information
 - analogically
 - symbolically
- This distinction is critical because What we *can* think depends on the nature of the mental representations for the ideas we are considering

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Overview

- Focus in the text: **Directed** thinking
 - mental activities used to achieve goals
- Examples:
 - Judgment - interpreting information
 - Reasoning - judging the truth of an assertion
 - Problem solving
 - Decision making - weighing the costs and benefits of a decision
- Alternatives to directed thinking
 - Emotions
 - Heuristics
 - Diffuse mode thinking

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Diffuse mode thinking: Not a new idea

- The research of the diffuse mode has almost all be done in the last 10 years
- William James (1842-1910)

"There is an 'alternation' of consciousness, such that the fringe briefly but frequently comes to the fore and is dominant over the nucleus of awareness."

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Looking Ahead

- For Monday
 - Gleitman: pp. 348-354
- Coffee after class at Phoenix Grill?



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