Critical appraisal of the Language and Situated Simulation theory

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Language & thought

- 17th century philosophy: thought is imagery (Locke, Hume, Kant, etc.)
- 20th century psychology: thought is uninterpreted formal symbols (Fodor)

Current theories argue that perceptual and linguistic representations must be combined to ground meaning.

LASS

Barsalou et al. (2008)

- Most theories of cognition assume single type of representation:
  - amodal symbols
  - modal information
  - statistical (e.g., connectionism)
  - linguistic context-vectors (DSM)
- Language and Situated Simulation (LASS) proposes two: linguistic forms & situated simulations
- linguistic forms: associations as in DSM
- situated simulation: reactivation of modal brain states in perception, action & introspection
  situated, because the context/background matters
- Both representations are probably implemented as statistical representations
- Completely amodal representations probably do not exist

LASS

1. Linguistic processing: purely based on form, superficial, fast
2. Situated simulation: follows 1), activation of associated simulations
3. Interactions of 1) and 2): simulations form contents of thought, words provide indexing and manipulation of this content
4. Statistical underpinnings: it is assumed that that the statistical structures of 1) and 2) mirror each other, because language often describes current situations

Evidence for LASS

- Paivio's dual code theory:
  - similar to LASS but assumes that abstract concepts are defined in linguistic system
  - assumes deeper processing in linguistic system
  - provides much empirical support for the existence of two systems of representation
  - developmental evidence shows modal system to develop faster
- Glaser's lexical hypothesis
  - lexical hypothesis: superficial processing independent of conceptual system
  - results: words are categorized slower than pictures
    pictures produce stronger conceptual effects
  - hypothesis: pictures access conceptual system directly

Evidence for LASS

Evidence from Barsalou's laboratory

- word association: quickest responses are linguistic, slowest object-situation, with taxonomic responses in between
- property generation: mostly object-situation responses because subjects had more time.
- abstract concepts: given appropriate tasks, situation system is activated for abstract concepts as well (deciding if a picture fits a word, instead of simple lexical decision task)

The Symbolic Species

Terrence Deacon (1997)

- Language co-evolved with the brain
- However, evolution of language is much faster than that of brain, thus language has adapted to be learnable, instead of relying on an innate LAD
- Brain evolved for concrete sensorimotor tasks, not language-specific functions

The Symbolic Species

Triadic theory of signs (Peirce):

1. icon: similarity to target
2. index: physical or temporal correlation
   An index is an association of two icons, for example sound images of a word and percepts of an object. (Saussurean signs)
3. symbol: conventional A symbol arises from a web of indexical relations (e.g., knowing the word dog, having seen dogs and knowing that it's a barking pet etc.)

Only the symbolic level makes abstract and counterfactual thought possible. This requires unlearning the associated indexical (correlational) aspects

The Symbolic Species

- Only humans seem to display symbolic reference
- Except Kanzi, a chimp that acquired proficience with symbols while experimenters were (unsuccessfully) training its mother
- This suggests that chimps also have a critical period, but since chimps do not learn language in the wild, this implies that the critical period is not an argument for a LAD
- Critical period is when brain is still maturing — high distractibility, poor working memory, prefrontal cortex looking for something to do

Material Symbols

Andy Clark (2006)

- Relation of language & thought: either we think in language, or ...
- Translation view: thought is mentalese (Fodor) or state vectors (Churchland)
- Complementarity view: cognitive benefits of language depend on complementary action of material symbols and more basic internal representations.

Three advantages of complementarity:

1. Language as source for additional targets for attention & learning
2. Coping with complex conjoined cues (integrating different cues seems to require linguistic processing)
3. Hybrid thoughts: '98' is usually not imagined differently from '97', so it is probably copied verbatim in thought

Goals of paper:

- Argue that abstract thought is a hybrid of language and imagery
- Determining whether LASS is compatible with Deacon's triadic symbolic reference
- Argue that Clark's material symbols are necessary to explain the coordination and integration of the two systems of LASS