CONCEPTS, PART I

Phil/Psych 256

Chris Eliasmith
What is a concept?

- Synonyms: idea, image, thought, notion
- Basic constituent of thought
  - e.g., a contentful symbol in RTM
- A category
  - type of thing, group to which many individuals belong
- Means of organizing our knowledge of the world
  - promotes ‘cognitive economy’
  - hierarchical
What is a concept not?

- Perceptual representation
- ‘non-conceptual’ content
- Although, perhaps, see Barsalou (2003)
- Just a symbol ‘vehicle’

Properties unrelated to content

Specifies properties of referent
When do you use concepts?

- In making inductive inferences; e.g. generating rules about some category.
- When applying experience to current problems (deduction/abduction).

In sum

- To generalize from instances to a categorical rule, or
- To hypothesize about the properties of an individual given that it is part of a particular category.
Example

- My beer is gone,
- Engineers always drink my beer,
- Cindy is an engineer,
- So she drank it

induction

abduction
When don’t you use concepts?

- Emotional and/or reflexive situations
- During fine-grained perceptual experience (again, 'non-conceptual' content)
- Fine-grained/rapid motor control?
- For lots of things that are the focus of NFAI
Brief history

- Conceptual analysis has long been the domain of philosophy (Socrates).
- What does 'concept x' (justice, friendship, knowledge, mind) really mean/apply to?
- The origin of concepts has also been a long standing philosophical debate (innate or learned)?
- Conceptual metaphysics is more relevant to cognitive science
- What are concepts?
Brief history (cont.) (from Cummins, 1984)

Aristotle

Locke, Hume

Hobbes
Brief history (cont.)

- During behaviorist years, concepts were considered a poor way of explaining behavior – too imprecise & mysterious.

- After the cognitive revolution, concepts became important for psychological explanations.

- 'Knowledge representation' became a central problem in AI because it quickly became clear that how you represent something can greatly affect what kinds of reasoning you can quickly do about that something (picture vs. words).

- In the 70s many proposals about knowledge representation were first presented.

- The central question became 'what do you need to know about the properties of X to have a concept of X?' or more simply 'what is the structure of a concept of X?'
Different representations have different strengths/weaknesses
Dog
Animal, mammal
- legs, 4
- ears, 2
- sound, bark
- touch, fuzzy
Concepts as definitions

The 'classical view': you must know the singly necessary and jointly sufficient properties of X in order to have a concept of X.

- necessary: the properties that all Xs have to have (X → p)
- sufficient: together these are all the properties that Xs have to have (p → X)

When does this work?

- for kinship terms, mathematical concepts, some legal terms

When doesn’t it?

- 1) for natural-kind concepts
- 2) can’t think of good definitions for most concepts
- 3) for explaining typicality effects
Typicality effects for fruit  
(Adapted from Malt and Smith, 1984)

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<td>Olive</td>
<td>2.25</td>
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<tr>
<td>...</td>
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Give two (novel) examples of how concepts are used when reasoning.

If Marx was just like Searle, in a chat room:

MARX> Capitalism totally sucks…

MARX> Let’s go bowling

Phi256> wtf?