



Judicious Incoherence: Towards a Resource-Bounded Cognitive Theory of Language Understanding

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- Humans are not perfectly rational
 - Well studied, e.g. Bounded Rationality
- Humans are not even *coherent*
 - An agent can be coherent without being rational, but not vice versa

Bounded Rationality

- Agent's aim: make optimal choice given beliefs
- Optimisation may be computationally hard
- Under resource bounds, heuristics are necessary

Beyond Bounded Rationality

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- Coherent theory of incoherent behaviour?

Truth-Conditional Semantics

“the meaning of a sentence is the method of its verification... there is some uniform means of deriving all the other features of the use of any sentence from this one feature” — Dummett (1976)

Beyond Truth-Conditional Semantics

- Reducing all kinds of understanding to truth is computationally hard

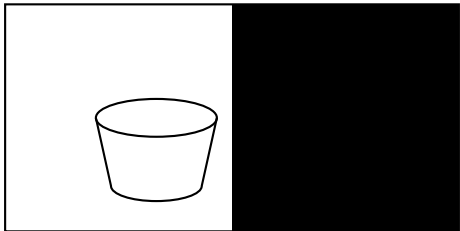
Beyond Truth-Conditional Semantics

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Beyond Truth-Conditional Semantics

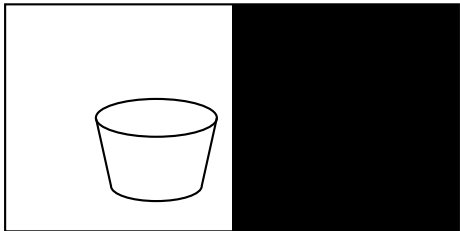
- Reducing all kinds of understanding to truth is computationally hard
- Any truth-conditional theory is incomplete
- Instead: multiple kinds of inference, which don't need to be coherent with each other

World-inferential understanding



“a cup and a bowl”

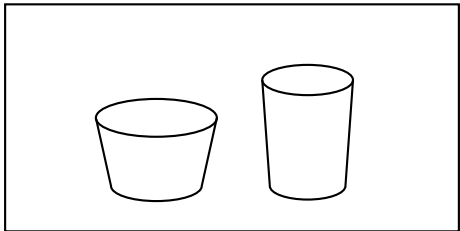
World-inferential understanding



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Can you see the bowl?

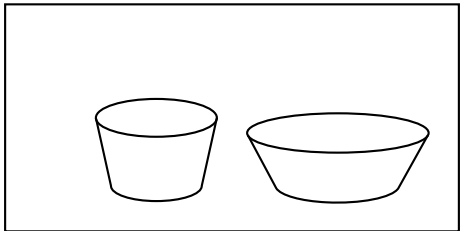
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- May not have coherence between:
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 - World-inferential linguistic knowledge
 - Truth-conditional linguistic knowledge

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 - World knowledge
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 - Truth-conditional linguistic knowledge
- Project aim: empirically measure incoherence, and develop models of incoherence

Beyond Bounded Rationality

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- Coherent behaviour is still *ideal*
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- Judicious incoherence: more important inferences are more coherent

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- “Coherence as regulariser”

Summary

- Language understanding involves multiple inference processes
- Being coherent is computationally hard
- Instead: judicious incoherence