

Towards a Pragmatical Grounding of Large Language Models

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1 Grounding Problem of AI

Harnad 1990 “The Symbol Grounding Problem” of symbolic AI systems

Bender et al. 2021 “Stochastic Parrots”

Bender and Koller 2020 “... Meaning, Form, and Understanding in the Age of Data”

- Grounding problem persists on non-symbolic AI systems
 - Meaning is a relation between
 - form and communicative intent
 - form and something external to language
- LLMs have no meaning, only form
- LLMs miss reference on actual world

2 Mental States

Rees (2022) stated an ontological error

Line of argument like this:

- Understanding, meaning, intentions are mental states.
- So far, mental states have been ascribed exclusively to humans.
- LLMs don't have mental states because they are not human.
- Therefore, the output of LLMs has no meaning.

→ No use of mental concepts as basic concepts, no communicative intent

Hypothesis:

„LLMs are not grounded in our actual world.“

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3 Philosophers on Empiricism

Quine 1951 “Two Dogmas of Empiricism”

- Analytic-synthetic distinction **is wrong**.
- Reductionism **is wrong**.

Davidson 1973 “On the Very Idea of a Conceptual Scheme” - third dogma of empiricism

- Dualism of scheme (form, language) and content (world, objects) **is wrong**.

→ Empiricism is false.

Reference and truth are problematic.

- No reference from linguistic terms to immediate experience
- No relation to something external to language

→ No grounding of language?

4 Grounding by Practices

Grounding

- not by reference or relation

Grounding

- by handling objects
- by experiential learning during practical action

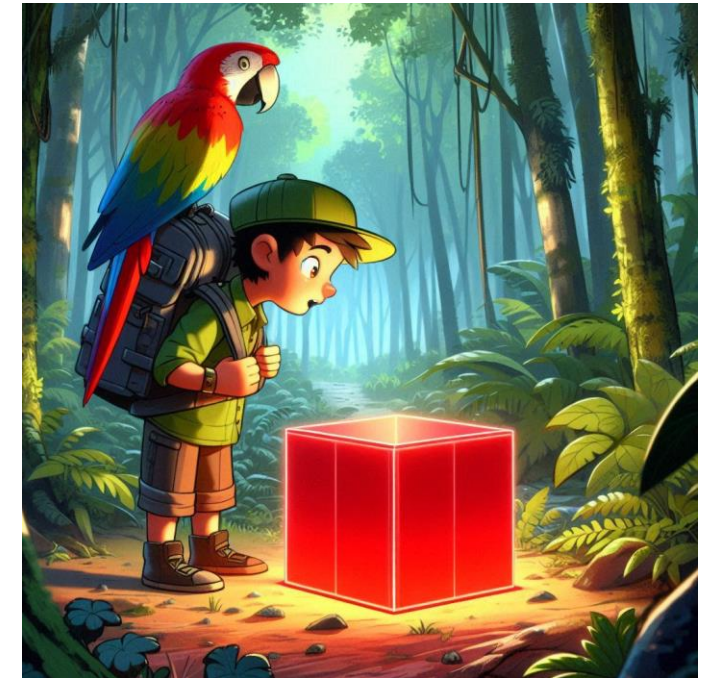
Brandom, Habermas as two representatives of pragmatism



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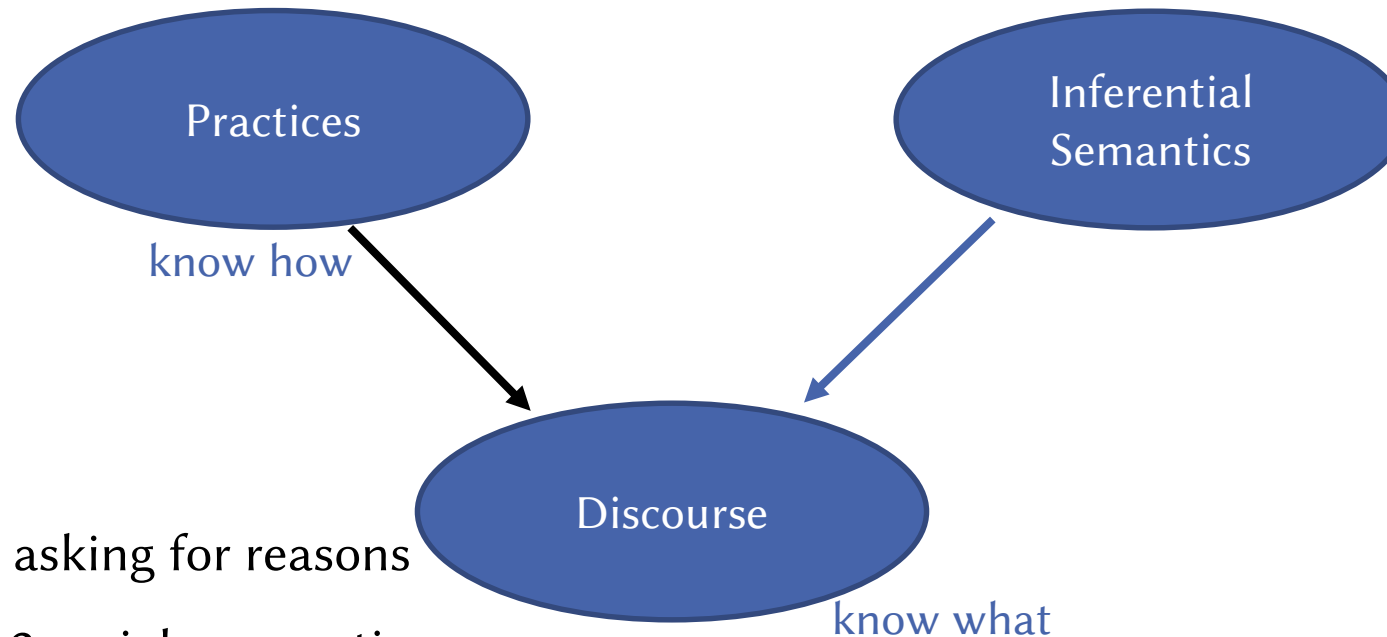
5 Brandom: Parrot and Observer

- Brandom: Difference between parrot and observer
 - Parrot responds with „That’s red“ seeing a red thing.
 - Observer understands the concept of „red“
 - Understand a concept:
 - Know material inferences of a concept
 - i.e. know premises and conclusions of concept
 - „If I get a red-wrapped present, it must be my birthday.“
- Inferential Semantics (Sellars 1953 „Inference and Meaning“)
- Do LLMs have inferential semantics?
 - Do LLMs have concepts?



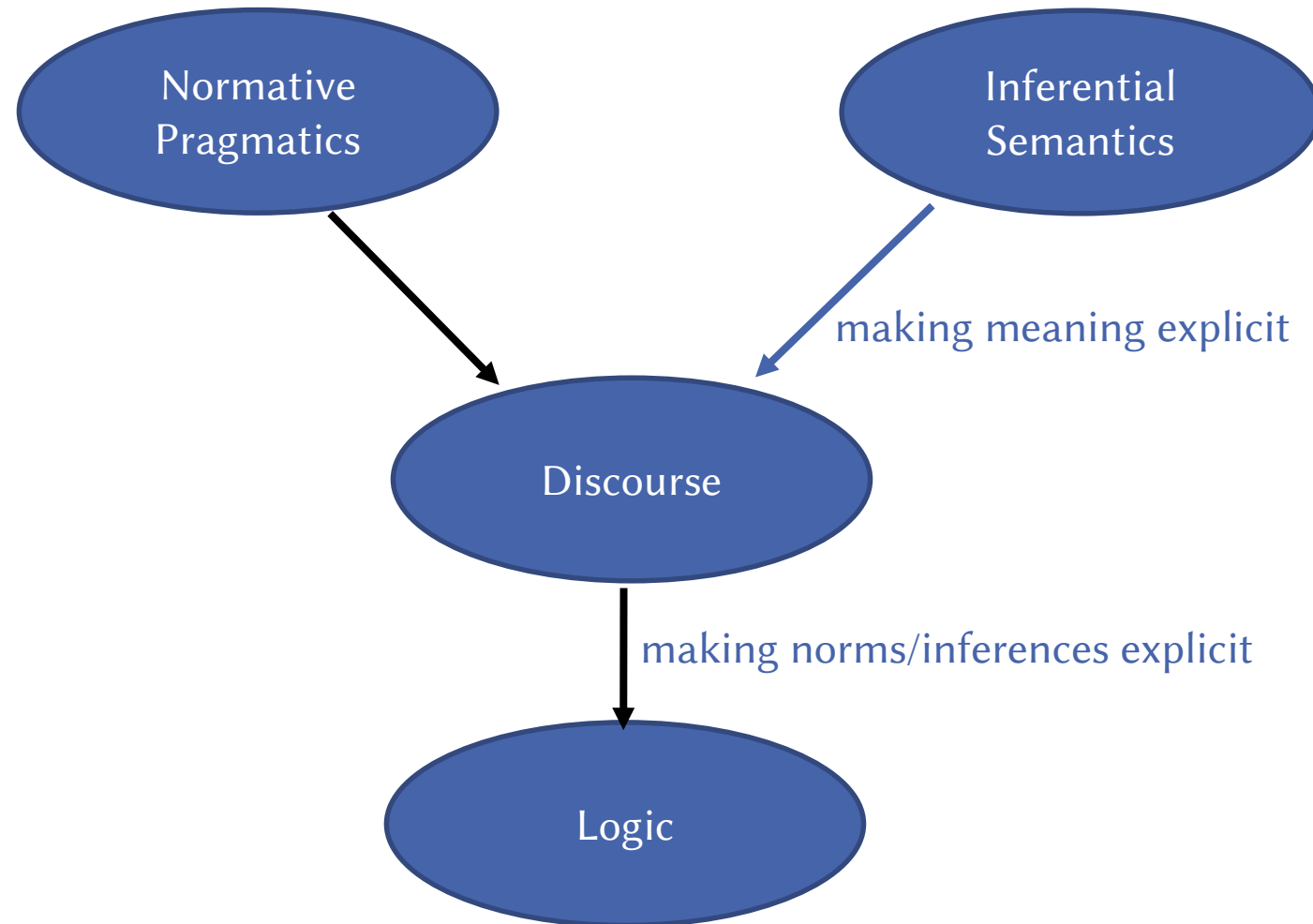
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5 Brandom in „Making it Explicit“ 1996



- Game of giving and asking for reasons
- Commitments with 2 social perspectives
 - undertaken by Speaker
 - attributed by Hearer to Speaker
- Keep score of commitments → memorize and update them
David Lewis 1978 “Scorekeeping in a Language Game“

5 Brandom in „Making it Explicit“ 1996



5 Brandom: Two Social Perspectives

Example

- A makes an assertion to S: „Kamala Harris is currently vice president of the United States.“
- A undertakes commitment to this assertion.
- S attributes to A commitment to this assertion.
- S, but not A, knows: „Kamala Harris was a former attorney general in California.“
- Is A committed to substitution „A former attorney general is currently vice president“?

De re → representational perspective

- „A claims **of** the former attorney general **that** she is currently vice president.“
- S undertakes commitment and responsibility for the substitution.
- S doesn't attribute it to A.

De dicto → propositional perspective

- „A claims **that** the former attorney general is currently vice president.“
- A never claimed that.
- S must not attribute commitment and responsibility for the substitution to A.

6 Habermas (Theorie des kommunikativen Handelns 1981)

Criticizes functionalist reason

- distinction of life-world and system

Life-world

- individuals interact and communicate
- engage with an objective world
- share understandings, cultural traditions, and social norms

System

- refers to the structured, organized aspects of society
- operates through formal mechanisms and instrumental rationality
- communication and social integration of life-world is disrupted

6 Habermas (Wahrheit und Rechtfertigung 1999)

Life-world

- Transition from action to discourse
 - **If** “practices damage and contradictions emerge in life-world”
then subjective certainties **evolve to** “claimed truths”
- Discourse: justification by exchange of arguments
 - Participants adopt a reflexive attitude with two different perspectives
 - Participants argue about the truth of statements

6 Habermas – Learning Process

Learning processes

- with actions in life-world
- with discourse in life-world
- with systems

7 What about Large Language Models (LLM)?

Hypothesis: „LLMs are not grounded in our actual world.“

Brandom:

- There is no scorekeeping, no memorization of commitments

Habermas:

- There is no discourse on true arguments, no learning process in the life-world

Due to batch processing of pre-training and fine-tuning:

- No incremental, no continuous learning
- No parameter update during dialog
- No learning by individual experience
- No practice in world

8 Possible Objection

Context window of LLM memorizes dialog (and personal history)

Brandom 2008: „... the updating process is highly sensitive to collateral commitments or beliefs”

- Update of all parameters would help
- But: no parameter update with in-context learning

Change of meaning of one concept changes meaning of other concepts.

- But: no adjustment of interrelated internal structure elements

Thank you!

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5 Brandom in „Making it Explicit“

