HOW DOES HAVING A BODY MAKE A DIFFERENCE?

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UNDERSTANDING AND EXPLAINING COGNITION

The Received View (or Nearly Enough)

Core thesis: computations are internal to the body and separable from the world. The inside is what is relevant for cognition.

Behaviors modeled as non-conscious computations involving representations, **contingently** realized in biological nervous systems

> A **computation** is a systematic transformation of information-bearing states according to rules defined by their formal or causal structure, such that the transitions can be interpreted as processing **representations**.

Classical: Representations are symbols that are conceptually transparent and semantically interpretable.

Non-classical (including neural networks and dynamical approaches): No clearly bounded symbols, but the vectors or dynamics can be understood representationally. They may be conceptually opaque.

> Related to the problem of interpretability and explainability in LLMs.

Undergirds the intelligibility of:
→ Multiple Realizability
→ Brains in vats.
→ Future interaction through our avatars in a virtual world while our bodies remain housebound.
→ Simulation Theory.
→ LLMs have world-models derived from the linguistic "shadow" of our sensory engagement.

Embodied Cognition (EC)

Core thesis: Mere internal computations are insufficient for realizing cognition.

Heterogeneous research program centering a cognitive agent's body and/or environment

Phenomenological: Engagement with the environment is direct embodied coping, the world and body co-disclose sense and meaning.

Robotics: The world is its own representation, no need for reduplication of the environment inside the system.

Ecological/Dynamical: Perception is of affordance, cognition is real-time dynamic coupling between body and environment

Extended Mind (including Artificial Life): The unit of analysis for cognition can include body, artifacts, environment, and the interaction between bodies through cultural systems.

> These interactions can be assembled on the fly only later to dissolve into different units of analysis.

Evidence is a mishmash of experimental psychology, engineering considerations, phenomenology, and philosophy of science

Skeptical of:
→ Mainstream Cognitive Science
→ LLM minds

DOES EC SHOW THAT BODY IS CRUCIAL?

Anti-EC positions maintain that what is crucial is that the body and environment be **adequately represented internally** so that the computations are effective in preserving the cognitive agent.

Against the Phenomenological Argument for EC

Phenomenology presupposes an ontology of consciousness that we need not accept.

> **Illusionism** is the view that consciousness should not be understood as irreducible, perspectival subjectivity. Our conception of consciousness is a misrepresentation of an underlying internal process.
>
> Thus, the Received View can argue that there is no properly phenomenological evidence for attunement.

Computing elements are so granular that they are conceptualized and reported as direct and pre-reflective engagement.

Phenomenological argument probably does knock out the classical view.

Against the Robotics/Ecological/Dynamical Argument for EC

This suite of arguments show that

> (1) What must be represented can't be established *a priori* and (2) That the computations have to occur at time scales that allow fluid interaction between the inside and the outside of the cognitive agent.
>
> Thus, the Received View can argue that we may have been wrong about what must be represented and about what sorts of computations will be **adequate to temporal demands of cognition**.

These EC considerations probably also undermine classical versions of the received view.

Against the Extended Mind Argument for EC

Extended mind arguments show that which elements of a system are the representations and which are the things represented can't be established *a priori*.

> Thus, the Received View can argue that there is **significant elasticity** in how we draw the boundaries between the inside and the outside of a cognitive system, but that—once established for particular explanatory purposes—what matters is the internal representation and computation (the body).

Consider standard extended mind and distributed cognition cases like:

→ Otto + his notebook
→ Ship navigation

HOW MIGHT BODY ACTUALLY MATTER?

In accepting that computation must be adequate to different time scales and in embracing boundary elasticity, there is significant danger of sliding to a **pan-computationalism**, that the universe is just a singular computation. **Bounded bodies are necessary for there to be the phenomenon of intelligence.**

I am tempted by a view that treats bodies as local low-entropy systems. (See free energy approaches to life and cognition, e.g., Karl Friston's work).