

Comments on Pearlberg's "Brains Without Parts: Reframing the Debate Between Dynamicists and Mechanists"

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Mechanistic Explanation Desideratum (ME)

Explanations in the biological sciences *should* describe mechanisms: entities with specific roles, composed by other entities that interact causally.

(ME) entails...

- either Dynamical systems explanations aren't genuinely explanatory,
or Dynamical systems explanations are genuinely explanatory qua instances of mechanistic explanations.

Solving the dilemma requires:

1. Reject or relax (ME),
2. Propose alternative desiderata for explanation, and show how dynamical systems explanations satisfy them.

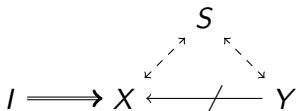
One Interpretation of Pearlberg's Main Argument

- P1 If P is an appropriate explanatory desideratum, then in principle all systems should have explanations that satisfy P
- P2 Some systems cannot have explanations that satisfy (ME)
- C1 (ME) is not an appropriate explanatory desideratum.

Note: a similar argument could be made against the dynamicists (e.g., let P be “having a description in terms of dynamical equations”)

Alternative: Use the argument as a reductio for (P1).
⇒ Pluralism about models of explanation!

Some systems cannot have explanations that satisfy (ME)



Separability: X is separable iff we can intervene on X and observe a change in S while holding every other part of S constant.

- P3 If X is a component in S , then X and S are mutually manipulable.
- P4 If X and S are mutually manipulable, then X is separable from other parts of S (e.g., Y)
- P5 For some S , there is no X such that X is separable from other parts of S .
- C2 For some S , there is no X such that X is a component in S .

P5 For some S , there is no X such that X is separable from other parts of S .

Conditional Strategy: *“The claim that the causal contributions of the parts of cognitive systems are not separable is very controversial, and I will not be weighing in on that debate here. Rather, my claim is that if the dynamicists are correct in claiming that the causal contributions of the parts of cognitive mechanisms are not separable, then this spells trouble for the (ME) approach to explanations in cognitive science”.*

Is this conditional strategy warranted? P5 is precisely the point of disagreement between dynamicists and mechanists!

Mechanist response: Failures of separability are merely apparent. They result from current epistemic limitations.

Some questions that could help to complement Pearlberg's paper...

1. Should we look for unifying models of explanation in cognitive science?
2. What's the positive case for the claim that the causal contributions of the parts of cognitive systems are not separable?
3. Do dynamical systems models satisfy an explanatory desideratum beyond mere predictive accuracy? Is it possible to characterize such a desideratum?