Systems Theory and the Metaphysics of Composition

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Abstract

Ideas about composition from systems theory – recursive unity and emergent attributes – are applied to the metaphysical and meta-metaphysical debates about the ontological status of composites.

These ideas suggest the rejection of both extremes of universalism and nihilism, favoring instead the intermediate position that some composites exist in a non-trivial sense – those having unity and emergent novelty – while others do not.

Systems theory is egalitarian: it posits that what exist are systems, & accords them all ontological parity. Systems are also different, & some are fundamental, but what exists is not merely the fundamental, and the fundamental is not merely the foundational.

The status of composites raises non-trivial issues, but mereology would benefit from addressing scientifically interesting questions. It might then contribute to a scientific metaphysics.
• Metaphysical & meta-metaphysical debates on composition

• Systems ideas relevant to these debates

• A systems position on these debates

• Broader philosophical perspective: systems ontology & scientific metaphysics
Illustrative mereological questions:

1. Does composite of coins-in-pocket + Eiffel Tower “exist”?  

2. If wood particles arranged “chair-wise,” does the composite called a chair “exist”?  

Metaphysical positions

NIHILISM

No composites exist

UNIVERSALISM

All composites exist

CONTINGENCY

(Restricted Composition)

Some composites exist

“exist” in some sense beyond their parts
## Meta-metaphysical positions

<table>
<thead>
<tr>
<th>DEFLATIONISM</th>
<th>LEGITIMACY</th>
</tr>
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<tbody>
<tr>
<td>The metaphysical debate is silly.</td>
<td>The metaphysical debate is meaningful.</td>
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**REFORM**

The debate needs *reformulation*.
For these illustrative questions:

1. Does composite of coins-in-pocket + Eiffel Tower “exist”?

2. If wood particles arranged “chair-wise,” does a chair “exist”?

Metaphysical answers:

- **NIHILISM**: NO
- **UNIVERSALISM**: YES
- **CONTINGENCY**: PROBABLY NO FOR #1, YES FOR #2
For these illustrative questions:

1. Does composite of coins-in-pocket + Eiffel Tower “exist”? 

2. If wood particles arranged “chair-wise,” does a chair “exist”? 

Meta-metaphysical answers:

- **DEFLATIONISM**: *SILLY QUESTIONS*
- **LEGITIMACY**: *WORTH THINKING ABOUT*
- **REFORM**: *REFORMULATE THE QUESTIONS*
• Metaphysical & meta-metaphysical debates on composition

• **Systems ideas relevant to these debates**

• A **systems position** on these debates

• Broader philosophical perspective: **systems ontology & scientific metaphysics**
Definition of system

- System = \{ elements, relations between elements \}

- Relations are not given their due in mereological debates (evidenced by “chair-wise” formulation).

![Diagram showing elements A, B, and C with AB and BC relations]
Augmented definition of system

• **Recursive unity** *(definition of ‘system’ is made recursive):*
  – A system is a set of elements and relations between elements, where *system is an element* at a higher level and *elements are systems* at a lower level.

• **Emergent attributes** *(add attributes to elements & relations):*
  – Relations organize elements *via attributes* (properties), which belong to elements or relations or both (with possible mismatch).
  – Attributes are either *upwardly emergent* from relations that organize elements or downwardly emergent from higher level relations that the system participates in as an element.
Recursion

System simplified here to elements A and B and relation AB. System S and environment E are elements in relation SE. Element A is also a system that organizes its internal elements. Recursiveness continues above and below.
Unity

• **Quantitative:** mutual information, $I(A:B) > 0$

• **Topological (for $\geq 3$ variables):** not decomposable without loss
  – Extreme non-decomposability (unity) shown in Borromean rings
Emergent attributes

- System has relation, AB, linking e₁ and e₂ via attributes A and B. The system as higher level element (equivalent to AB) has emergent attribute C, through which system relates to its environment. Minimal requirement for emergence is novelty (not irreducibility).
• Metaphysical & meta-metaphysical debates about composition

• Systems ideas relevant to these debates

• A systems position on these debates

• Broader philosophical perspective: systems ontology & scientific metaphysics
A systems *metaphysical* position

**CONTINGENCY**

(RESTRICTED COMPOSITION)

*Some* composites exist

*Namely those which exhibit*

(a) *recursive unity* &

(b) *emergent attributes*
A systems meta-metaphysical position

REFORM

The debate needs reformulation.

Formulate the conditions for
(a) recursive unity &
(b) emergent attributes
that are sufficient & necessary
for restricted composition
• Metaphysical & meta-metaphysical debates on composition

• Systems ideas relevant to these debates

• A systems position on these debates

• Broader philosophical perspective: systems ontology & scientific metaphysics
Ontological parity

In their similarity, all systems are equal in ontological status. In their difference, some systems may be more fundamental than others. But

“what exists” ≠ “the fundamental”

“the fundamental” ≠ “the foundational” (lowest level)

Arrow of scientific explanation points both down & up.
Ontological parity

As centers of structure/function, all systems have equal ontological status (& existence is fractal)
Scientific metaphysics

• Systems theory is an attempt to construct an exact & scientific metaphysics (Bunge)

• Systems theory favors the positions of
  – in metaphysics: contingency
  – in meta-metaphysics: reform

• Metaphysics – e.g., mereology – should take up scientifically interesting questions, e.g.,
  – What are the units of (evolutionary) selection?
  – Is lichen (an interspecies composite) an organism?
But not to dismiss without consideration claims of universalism…

• What seems to be a claim of universalism might really satisfy the requirements of restricted composition:

• For example, the composite “coins in my pocket & Eiffel Tower,” might qualify as a genuine composite, if

• the coins in my pocket are French, acquired at the Eiffel Tower.
And **nihilism** does also have some appeal

- As an expression in the spirit of Buddhist *shunyata*, it may relieve anxiety.

- *Buddha*: Decay is inherent in all composite things

  *Nihilist*: There are **no** composite things

  So…not to worry!
References