Grounding and Emergence

David Chalmers

Or: The United Nations of Interlevel Relations

David Chalmers

Or: The Happy Family of Interlevel Relations

David Chalmers

Or: The High School of Interlevel Relations

David Chalmers

Or: The Top Ten List of Interlevel Relations

David Chalmers

Top Ten List

1. Strong emergence
2. Functional realization
3. Supervenience
4. Weak emergence
5. Grounding
6. Composition
7. Determinate/determinable
8. Reduction
9. Type identity
10. Scrutability

Jessica's Top Ten List

1. Subset realization
2. Determinable/determinate
3. Part-whole
4. Composition
5. Constitution
6. Causal emergence
7. Causation
8. Identity
9. Truthmaking
1000. Grounding

PhilPapers Top Ten List

1. Identity [868]
2. Mereology [848]
3. Reduction [529]
4. Supervenience [496]
5. Truthmaking [459]
6. Emergence [384]
7. Realization [172]
8. Grounding [97]
9. A Priori Entailment [45]
10. Determinate/determinable [44]

Or: The Political Spectrum of Interlevel Relations

David Chalmers

Spectrum

- grounding: conservative

- emergence: radical

Spectrum

- identity

- grounding: conservative

- emergence: radical

Spectrum

- identity

- grounding: conservative

- supervenience

- emergence: radical

Spectrum

- identity

- grounding: conservative

- supervenience

- emergence: radical

- independence

Plan

- 1. Weak Emergence

- 2. Strong Emergence

- 3. The Role of Grounding

- 4. The Epistemology of Grounding

Grounding vs Emergence

- What's the relationship between grounding and emergence?

  - Weak emergence entails grounding.

  - Strong emergence is incompatible with grounding.

What is Weak Emergence?

Weak Emergence as Surprising Grounding

- Weak emergence = surprising grounding (groundee unobvious from grounder, though deducible in principle).

Weak Emergence and Other Relations

- Not all grounding is surprising, so not all grounding is weak emergence.

- E.g. Determinable/determinate and composition are never (?) surprising, so are not weak emergence.

Weak Emergence as Subset Realization

- Jessica: weak emergence = (a sort of?) functional realization.

- functional realization = subset realization: phi weakly emerges from psi when phi has a subset of psi's causal powers

Worry 1

- I think: many but not all cases of functional realization are cases of weak emergence

  - unsurprising realization, e.g. billiard ball from atoms.

- some cases of weak emergence are not cases of functional realization

  - surprising nonfunctional grounding, e.g. spatial structure in crystals.

Worry 2

- Potential worry: no case of weak emergence is a case of subset realization, as subset realization is always unsurprising

  - The subset relation is too immediate to be surprising.

Worry 3

- The subset realization view requires identity between macro causal powers and micro causal powers.

- E.g. power to pump blood is identical to a power to move masses and charges?

  - implausible reductionism about powers? if so, need a further account of relation between micro and macro powers.

What is Strong Emergence?

SE1: Dependence without Grounding

- Strong emergence: dependence without grounding? [or: fundamentality with dependence]

- Worry: m-necessitation without grounding

  - Does {Socrates} emerge from Socrates?

  - Space between grounding and strong emergence.

SE2: Nomological Supervenience

- Strong emergence (van Cleve, Noordhof, Chalmers): nomological supervenience without metaphysical supervenience.

Nomological Supervenience: Worries

- Worry 1: diachronic laws

- Worry 2: dependence of force on mass

- Modified: synchronic nomological supervenience on an appropriately autonomous base

Nomological Supervenience: Worry 3

- Worry 3 (Umut): Can't distinguish causal powers of base and based

  - Need fine-grained causation.

  - I think: there can be (nomologically supervenient) emergent properties with or without emergent causal powers

  - Unidirectional or bidirectional laws.

Nomological Supervenience: Worry 4

- Worry 4 (Paul): What about strong emergence on powers/dispositionalist view where all laws are metaphysically necessary?

- Reply: Understand strong emergence as synchronic nomologically necessary *causal* dependence on an appropriate base.

Emergence and Causation

- Q: Can Neil's tools of difference-making to help understand the micro-macro causation involved in strong emergence?

SE3: Non-Subset Realization

- Jessica: phi strongly emerges from psi when it has causal powers that aren't causal powers of psi.

- Worry 1: Only works for strong causal emergence.

- Worry 2: Previous worry suggests that pumping blood is strongly emergent.

SE5: Partial Without Full Grounding

- Stephan: strongly emergent properties are partially but not fully grounded in the base.

- Worry: excludes cases of macrofundamentality.

- Different target: the space between macrofundamentality and grounding.

- What about metaphysical supervenience?

SE5: Fundamentality Without Basicness

- Tim: strongly emergent properties are fundamental properties of nonbasic but fundamental objects

  - consistent with nomological view (zombie worlds where the parts don't compose a fundamental object?)

Strongly Emergent Objects?

- Question: Do strongly emergent properties require strongly emergent objects to bear them?

- Related question: Must fundamental properties attach to fundamental objects?

Substance Dualism and Russellian Monism

- Substance Dualist: Yes. Fundamental mental properties are had by fundamental nonphysical objects

- Panpsychist and Russellian Monist: Yes. Fundamental (proto)mental properties are had by fundamental physical objects

Property Dualism

- (NonRussellian) Property Dualism: Fundamental mental properties are had by nonfundamental physical objects.

- Q: Is this coherent or plausible?

Tim's Middle Way

- Tim: Yes. Fundamental mental properties are had by fundamental physical objects: but these objects are nonbasic, so composed of physical parts.

Worries

- Q1: Can object be composed of Xs without being necessitated by Xs?

- Q2: What's the relation between these fundamental composed objects and the corresponding nonfundamental composed object that's present in the zombie world?

- Q3: Why is this better than substance dualism?

Grounding

- Jessica: Grounding (and emergence?) are too abstract: the work is done by specific grounding (and emergence?) relations.

Concepts and Cells

- Reminiscent of Machery, *Doing Without Concepts:* science doesn't need to appeal to concepts since all the work is done by specific kinds: exemplars, prototypes, etc

- Cf: biology needn't appeal to cells since all the work is done by X cells, Y cells, etc.

Generic Kinds

- Intermediate view: science uses generic (genus) kinds (concept, cell) as well as specific (species) kinds (prototype, X cell), even though specific kinds do the primary work.

- Specific kinds ground generic kinds.

- Generic kinds unify specific kinds.

Grounding as Generic Relation

- Taking this line: grounding is a generic relation, individual grounding relations are specific relations.

- We can theorize about grounding as well as about the specific relations.

Grounding Grounding

- Further: the specific relations ground the generic relations.

- So e.g. subset realization doesn't replace grounding: it grounds grounding!

Grounding and Supervenience

- On this approach: grounding is in no way in competition with specific relations.

- Rather, it's in competition with (and maybe replaces) supervenience, for the role of the generic relation than unifies the specific relations.

Epistemology of Grounding

- Chalmers (1996): there's an epistemological condition on supervenience.

- Metaphysical supervenience on the physical requires scrutability (a priori entailment) from the physical. (No brute necessities!)

- Q: Is there a corresponding epistemological condition on grounding?

Weak Condition

- Grounding (arguably) entails supervenience.

- So if scrutability is required for supervenient, it is required for grounding.

- Likewise: if consciousness is not scrutable from the physical, it's not grounded in the physical.

Strong Condition

- Q: Is there a stronger epistemological condition that stands to grounding as scrutability stands to supervenience?

  a priori entailment: supervenience

  X: grounding

Hypothesis

- Hypothesis: Analytic entailment is required for grounding.

  a priori entailment: supervenience
  analytic entailment: grounding

Two-Dimensional Analysis

- Of course there are a posteriori necessities (e.g. 'water = H2O'), so there's supervenience without scrutability

- But these always involve expressions with nontrivial 2D structure: primary intension distinct from secondary intension
  primary: watery stuff is H2O
  secondary: H2O is H2O

Twin-Earthability

- Rough rule: a posteriori necessities always involve Twin-Earthable expressions: those subject to Putnam-style twin scenarios

  - Oscar: 'water' refers to H2O

  - Twin Oscar: 'water' refers to XYZ

Non-Twin-Earthability

- Non-Twin-Earthable expressions: 'cause', 'conscious', 'believe', 'philosopher', 'zero', 'plus', 'square', 'time'?

- Underlying phenomenon: epistemic rigidity: same referent in every epistemically possible world.

Twin-Earthability and Supervenience

- Thesis: When S is non-Twin-Earthable, S is a priori iff S is necessary.

- Apply to 'If P, then M' (P is micro, M is macro).

- When P and M are non-Twin-Earthable, M is supervenient on P iff M is a priori scrutable from P.

Twin-Earthability and Grounding

- Thesis: When S is non-Twin-Earthable, S is analytic iff S is metaphysically trivial.

- Apply to 'If P, then M'

- When P and M are non-Twin-Earthable, M is grounded in P iff M is analytically entailed by P.

Analyticity

- Analyticity = cognitive insignificance = epistemological condition on grounding

Supervenience Without Grounding

- Plausible cases of supervenience without grounding (mathematics, normativity) are all cases of non-analytic scrutability.

Grounding Without Analyticity

- The most plausible cases of grounding without analytic entailment all involve Twin-Earthable expressions (e.g. water/H2O, mass, etc).

- Others can be explained away/excluded.

Bold Hypothesis

- Bold rationalist hypothesis: necessity is grounded in airports

- Likewise, metaphysical triviality is grounded in analyticity.

- Metaphysical grounding is grounded in conceptual grounding.

Reverse Hypothesis

- Reverse rationalist hypothesis: apriority is grounded in necessity

- Likewise, analyticity is grounded in metaphysical triviality.

- Conceptual grounding is grounded in metaphysical grounding.

Triple-Barrelled Conclusion

- Either way: grounding grounds grounding!

Twin-Earthability and Grounding