Consequences of Conditional Excluded Middle

Jeremy Goodman (USC)

MIT – March 1, 2023

Physicalism
Concrete individuals never differ in how they are without there being some physical basis for that difference.[1]

CEM
For all p and q, either if p had been the case q would have been the case, or if p had been the case not-q would be the case.

- $\forall p \forall q((p \;\square\!\!\rightarrow q) \vee (p \;\square\!\!\rightarrow \neg q))$

- For instance: either this coin would land heads if I were to flip it, or it would not land heads were I to flip it.

Motivating CEM

Counterfactual ignorance

- Q: Would this coin land heads if I were to flip it?

- A: I don't know.[2]

Counterfactual decision theory

CDT Choose the available action with the highest *expected value*, where an action's expected value is the weighted average of the values of its possible outcomes, weighted by how likely you think it is that *the outcome would obtain if you we were to perform the action*. (Stalnaker, 1981 [1972], Hedden, forthcoming)

  – CDT gives reasonable verdicts for bets on coin flips only if we can be rationally uncertain counterfactual coin flips.

---

[1] Better: it is nomologically necessary that, for any concrete individual x and qualitative property F, if x is F, then for some G expressible in the language of physics (including mereology), it is nomologically necessary that all Gs coincide with Fs. (The 'coincides with' is to handle statue/clay issues, cf. Thomson (1998).) *Mutatis mutandis* for qualitative polyadic relations.

[2] Not "it depends what you mean" (as in cases of vagueness) or "hold on a minute" (as in cases of presupposition failure). This is a challenge for Stalnaker (1981)) and von Fintel and Iatridou (2002)), respectively.

1   A challenge for physicalism

> **TL;DR**: CEM can require individuals to differ in counterfactual respects even when they don't differ in any physical respects.

1. It is physically possible that there be a <u>Max-Black world</u>: a physically symmetric universe consisting of two duplicate iron spheres orbiting each other in empty space (Black, 1952).

2. For each sphere: either it would have been scratched if exactly one of them had been, or it would have been scratch-free had only one of them been (by CEM).

3. So (given uncontroversial counterfactual reasoning) exactly one of the spheres would have the property Π, where

   > $\Pi x =_{df} \exists y(x$ and y are duplicate iron spheres orbiting each other in empty space, and x would have been scratched if exactly one of x and y had been scratched).

4. Π is a qualitative property.

   Therefore, physicalism is false.

1.1   Why does it matter that Π is qualitative?

Compare: (a) but not (b) ought to be incompatible with physicalism:

(a) The spheres differ *phenomenally*: only one is conscious.

(b) The spheres differ *haecceitistically*: each sphere has the property of *being that very individual*, which no other individual has.

Properties/relations/propositions are <u>haecceitistic</u> if they 'involve' particular individuals, in the way that *being identical to Steve* and *that Steve is a philosopher* involve Steve; otherwise they are <u>qualitative</u>, like *being a philosopher* and *that there are philosophers*.

- If Π involved either of the spheres (or their parts or locations), then the fact that only one of the spheres has Π might pose no more challenge to physicalism than the boring truism (b) does.

2 The physicalist's haecceitistic gambit

- Given CEM, physicalists should hold that Π is haecceitistic.

- Moreover, given that all of its other ingredients are qualitative, Π is no more haecceitistic than _counterfactual implication_ (the relation that holds between propositions p and q just in case q _would have been the case if p had been the case_).

- If counterfactual implication is haecceitistic – involving at least one denizen of every possible Max-Black world, no less! – then that would undoubtedly be surprising. But is it objectionable?

- Notice that CEM already demands that counterfactuals draw surprisingly arbitrary distinctions – for example, concerning the outcomes of counterfactual coin flips – which are inscrutable from the underlying physical/non-modal facts.

- **And the standard tools for making sense of how this is possible can be repurposed here; cf. Stalnaker (1981).** <u>Idea</u>: our use of '□→' _constrains_ what relation it expresses (e.g., to one that obeys CEM), but _underdetermines_ that relation. So it is better to think of the meaning of '□→' as _indeterminate_ as between the many relations meeting these constraints. All of these relations will be highly haecceitistic if physicalism is true, but that doesn't require our use of '□→' to give any pride of place to the individuals involved (which it clearly doesn't).

3 The challenge of brave new worlds

> **TL;DR**: No _actual_ relation, such as counterfactual implication, can involve the _merely possible_ denizens of Max-Black worlds; so no relation is haecceitistic enough for the gambit to always work.

1. It is physically possible that there be a _brave new world_: a Max-Black world in which the spheres (and their material parts, and any other individuals in terms of which the spheres can be distinguished via physical relations) are _new_ – i.e., such that, in actuality, there are no such things as them(/they don't exist).

2. If physicalism is true, then in a brave new world both spheres stand in the same qualitative relations to any actually existing individual(s). So all properties involving only actually existing individuals fail to distinguish the spheres.

3. Π is a property that actually exists and would be a property distinguishing the two spheres in a brave new world.

4. Necessarily, any property that involves individuals that don't actually exists also doesn't actually exist.[3] (Fine, 1977, Stalnaker, 2012, 2022, Fritz and Goodman, 2016, Rayo, 2020).

   Therefore, physicalism is false.

4 Possible physicalist responses

- There couldn't be a brave new world:
  - there couldn't be new individuals (Williamson, 2013)
  - there couldn't be Max-Black worlds (Rocca, 2005)
  - even in Max-Black worlds there would always be enough actual concrete objects to distinguish the spheres in terms of their mereological relations to them (Yablo, 1987, forthcoming, Hawthorne, 2006, Goodman, unpublished)

- There is no such property as Π. (Edgington, 2008, Khoo, 2022, Stalnaker, 2022)

- Heacceitistic properties don't ontologically depend on the individuals they involve. (Skiba, 2022, Fairchild, forthcoming)

- Physicalism should be weakened, by changing its purview to:
  - _factual_ qualitative differences (Russell, 2015, Spencer, 2022)
  - qualitative _propositions_ (David Chalmers, p.c.)

- CEM is only _contingently_ true. Drawing on (Dorr et al., 2021):
  - □→ uses all the resources at its disposal to draw its arbitrary distinctions. But these resources are limited by what individuals there actually are. Had there been new individuals, there would have been _new propositions_ involving them, and _these_ can generate counterexamples to CEM.
  - But '$\forall p \forall q((p \; \Box\!\!\rightarrow \; q) \lor (p \; \Box\!\!\rightarrow \; \neg q))$' would still be true, because '□→' would then express a _new relation_ involving the new individuals. So we still wouldn't know the answer to "Would the coin land heads if it were flipped?", and we should still deliberate under the guise of the "would".

---

[3]Alternatively: $\exists xx \forall F \Box \forall y(F$ involves $y \rightarrow \Diamond(y \prec xx))$.

References

Max Black. The identity of indiscernibles. *Mind*, 61:153–64, 1952.

Cian Dorr, John Hawthorne, and Juhani Yli-Vakkuri. *The Bounds of Possibility*. Oxford University Press, 2021.

Dorothy Edgington. Counterfactuals. *Proceedings of the Aristotelian Society*, 108(1):1–21, 2008.

Maegan Fairchild. Symmetry and hybrid contingentism. In Peter Fritz and Nicholas Jones, editors, *Higher-Order Metaphysics*. Oxford University Press, forthcoming.

Kit Fine. Properties, propositions and sets. *Journal of Philosophical Logic*, 6(1):135–191, 1977.

Peter Fritz and Jeremy Goodman. Higher-order contingentism, part 1: Closure and generation. *Journal of Philosophical Logic*, 45(6):645–695, 2016.

Jeremy Goodman. Matter and mereology. unpublished.

Alan Hájek. Contra counterfactism. *Synthese*, 199(1-2):181–210, 2020.

John Hawthorne. Motion and plenitude. In *Metaphysical Essays*, pages 111–44. Oxford: Oxford University Press, 2006.

Brian Hedden. Counterfactual decision theory. *Mind*, forthcoming.

Justin Khoo. No fact of the middle. *Noûs*, 56(4):1000–1022, 2022.

Agustín Rayo. On the open-endedness of logical space. *Philosophers' Imprint*, 20(4):1–21, 2020.

Michael Della Rocca. Two spheres, twenty spheres, and the identity of indiscernibles. *Pacific Philosophical Quarterly*, 86(4):480–492, 2005.

Jeffrey Sanford Russell. Possible worlds and the objective world. *Philosophy and Phenomenological Research*, 90(2):389–422, 2015.

Lukas Skiba. In defence of hybrid contingentism. *Philosophers' Imprint*, 22(4):1–30, 2022.

Jack Spencer. Relativity in a fundamentally absolute world. *Philosophical Perspectives*, 36(1), 2022.

Robert C. Stalnaker. A defense of conditional excluded middle. In William L. Harper, Robert Stalnaker, and Glenn Pearce, editors, *Ifs: Conditionals, Belief, Decision, Chance, and Time*, pages 87–104. D. Reidel, 1981.

Robert C. Stalnaker. Letter to David Lewis. In William L. Harper, Robert Stalnaker, and Glenn Pearce, editors, *Ifs: Conditionals, Belief, Decision, Chance, and Time*, pages 151–152. D. Reidel, 1981 [1972].

Robert C. Stalnaker. *Mere Possibilities*. Princeton: Princeton University Press, 2012.

Robert C. Stalnaker. *Propositions: Logic and Ontology*. Oxford University Press, 2022.

Judith Jarvis Thomson. The statue and the clay. *Noûs*, 32:149–73, 1998.

Kai von Fintel and Sabine Iatridou. If and when 'if'-clauses can restrict quantifiers. Manuscript, MIT, 2002.

Timothy Williamson. *Modal Logic as Metaphysics*. Oxford: Oxford University Press, 2013.

Stephen Yablo. Identity, essence, and indiscernibility. *Journal of Philosophy*, 84(6):293–314, 1987.

Stephen Yablo. Everything exists: plenitude, kinds, and paradox. In Javier Cumpa, editor, *The Question of Ontology*. Oxford University Press, forthcoming.