

The Limits of Subtraction

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“The key to progress in metaphysics lies not with the interrogation of our language and/or concepts, but in the interrogation of reality itself. This is, in a sense, the opposite of Kant’s Copernican revolution, which sought to place the interrogation of our representations and representational capacities at the foundations of metaphysical inquiry. But that way, I believe, lies only philosophical darkness and error. I reject not just Kant’s Copernican revolution, but also the more recent, but still kindred, linguistic turn. Let us not interrogate our representations and concepts, I say. Let us rather interrogate the world.”

— Kenneth Taylor, *Meaning Diminished*

According to Taylor, the structure of language and thought are misleading guides to the structure of reality. That view is very much underwritten by our observations, over the past weeks, of the extent to which idealisations and fictions seem to pervade our ordinary thought and speech. But Taylor’s call to radically reverse Kant’s Copernican revolution, and to let our metaphysics be informed by direct investigation of the world instead, also returns us to a puzzle that (in some form or other) also seems to have motivated Kant. Whatever we find in the world, we are bound to represent our findings in speech and thought in our habitual way — what else can we do? But how do we tell apart the objective components of those descriptions from the subjective ones?

Antirealisms and their Counterexamples

Below, I list a range of antirealist positions, roughly in order of controversy, with the most widely accepted views at the top and the least popular ones at the bottom.

*Antirealism about the **Spatial Axes** (x , y and z)*

1) The normal force acts perpendicular to the x -axis.

2)
$$\left[-\frac{\hbar^2}{2m} \frac{d^2}{dx^2} + V(x) \right] \psi(x) = E\psi(x)$$

*Antirealism about **Fictional People** (and fictional places, objects, ...)*

3) We saw the Etna light up like Mount Doom.

4) Miss Trunchbull is the principal at Matilda’s primary school.

*Antirealism about **Numbers** (functions, sets, geometrical objects, modular forms ...)*

5) The rate of economic growth steeply increased.

6) Times square in New York has the shape of a right-angled triangle.



Antirealism about Rainbows (sundogs, shadows, the sky, mirror images, ...)

- 7) The rainbow ends right behind that hill over there.
- 8) During the eclipse, the sky turned dark.
- 9) Shadows can move faster than the speed of light.

Antirealism about Fields and Potentials

- 10) Objects always fall in the direction of least gravitational potential.
- 11) Currents produce magnetic fields.

Antirealism about the Past or Future (Napoleon, yesterday, the Twenty-third century, ...)

- 12) There is less snow today than there was yesterday.
- 13) By 2050, more than 90% of the world's remaining coral reefs will die.

Antirealism about Microscopic Objects (molecules, atoms, electrons, quarks, ...)

- 14) The electron is now traveling from the source to the sensitive screen on the other side.
- 15) If you do not eat any food with protein, you will die of starvation.

Nihilism

All of the above.

Here are a few more prominent anti-realist views, which are a bit trickier to rank:

Antirealism about Spacetime

- 16) Keep your belongings with you at all times.
- 17) The twins are different ages because Stella took the shorter path.

Mereological Nihilism

- 18) This table is made of wood.
- 19) Zoe broke the statue with a sledgehammer.
- 20) I made a hammock out of a long, thin, highly intelligent snake.

Eliminativist Materialism or Idealism

- 21) Joey's body is deteriorating, but his mind still functions perfectly.

Antirealism about Morality

- 22) We sometimes have an obligation to speak the truth.
- 23) Murder is wrong.
- 24) You ought to be more considerate.

Where do we draw the line?

Classic proposals to resolve this question have produced slogans like “Save the phenomena!” “To be is to be the value of a bound variable!” “Maximise explanatory economy!” But the application of those various criteria has on the whole proven to be no less controversial than the anti-realist theories themselves. In *Of Numbers and Electrons*, Cian Dorr looks for a better, more objective criterion.

Translation Manual

Dorr identifies are two “cheap” ways to map a realist theory T to an antirealist one: the map $T \mapsto T^\blacksquare$ and the map $T \mapsto T^\blacklozenge$. Let S be the target subject matter of things about which we are still realist (e.g. for the microscopic antirealist, S could be ‘macroscopic objects’). Now let $s_\@$ be shorthand *With respect to S , things are as they in fact are.*¹ and let m be the myth about the objects to be eliminated, which is taken to be included in T . Then

$$\begin{aligned} T^\blacklozenge &=_{\text{df}} \Diamond(s_\@ \wedge T) && \equiv \{ w : \text{for some } v \in m \text{ s.t. } w \sim_S v, T \text{ is true at } v \} && =_{\text{df}} T_S \\ T^\blacksquare &=_{\text{df}} \Box((s_\@ \wedge m) \supset T) && \equiv \{ w : \text{for all } v \in m \text{ s.t. } w \sim_S v, T \text{ is true at } v \} && \approx S(T \upharpoonright m) \end{aligned}$$

Here ‘ \equiv ’ denotes necessary equivalence. The equality $T^\blacksquare \approx S(T \upharpoonright m)$ holds if the following is true:

- i) $T \upharpoonright m$ is wholly about S (or: $\Diamond(s_\@ \wedge m \wedge T) \wedge \Diamond(s_\@ \wedge m \wedge \neg T)$ is a necessary falsehood)
- ii) m has no bearing on S (or: $\Diamond(s_\@ \wedge m)$ is a necessary truth)

These conditions are familiar from prior weeks: (i) is *Equivalence*, which ensures that $S(T \upharpoonright m)$ is well-defined, and (ii) is *Independence*, which ensures that $S(T \upharpoonright m)$ is a *full* proposition and not a partial one.

Two Criteria

Dorr’s Thesis. If conditions (i-ii) are a priori true, and all our evidence E for T is wholly about S , then T^\blacksquare is as good an explanation for E as T is. By contrast, T^\blacklozenge is a worse explanation for E than T is (except when (i-ii) hold, in which case T^\blacklozenge is necessarily equivalent to T^\blacksquare).

Explanatory Criterion. If our theory admits of an anti-realist formulation of the form T^\blacksquare , we should accept T^\blacksquare over T because it makes a better, more economical explanation of our evidence.

Yablo’s Thesis. The purported counterexamples to true anti-realisms are cases of implicit logical subtraction, and their loose readings do not imply the existence of the problematic entities in question.

Pragmatic Criterion. If the counterexamples can be explained as cases of implicit logical subtraction, then the corresponding kind of anti-realism is at least tenable. If it cannot, the corresponding kind of anti-realism is false.

¹ Thus the proposition $s_\@$ denotes the S -cell of the world of assessment: this is a different proposition relative to different worlds of assessment.

Given the exculpation account of loose talk, the *Explanatory Criterion* and the *Pragmatic Criterion* end up being equivalent, converging on the *Equivalence* and *Independence* conditions (i) and (ii) above:

- i) $T \uparrow m$ is wholly about S (or: $\Diamond(s @ \wedge m \wedge T) \wedge \Diamond(s @ \wedge m \wedge \neg T)$ is a necessary falsehood)
- ii) m has no bearing on S (or: $\Diamond(s @ \wedge m)$ is a necessary truth)

The modal formulation of (i) suggests a helpful alternative way of thinking about *Equivalence*: if it is possible for the actual S-state of affairs, combined with the myth m , to underdetermine whether T is true or not, then we have no good account of the loose reading or the explanatory value of T . And if the actual S-state of affairs, combined with the myth m , does always determine whether T is true or not, then we do have a good account of the loose reading and the explanatory value of T .

At least insofar as the *Pragmatic Criterion* is concerned, (ii) is far less important than (i). For while a failure of (i) leaves $S(T \uparrow m)$ completely undefined, a failure of (ii) still allows us to extract a partial proposition $S(T \uparrow m)$. Basically we only need m to intersect every epistemically possible S-cell, so that the partial proposition is defined on all worlds compatible with our knowledge.

Arguably, something analogous holds for the *Explanatory Criterion* too. Besides (i), what really matters for explanation is that $k \supset \Diamond(s @ \wedge m)$ is a necessary truth, where k is some body of known truths we are willing to take for granted in making the explanation.

Applying the Criteria

I'll consider three applications:

- A) *Antirealism about Mathematics*. This one we've done before. Concrete facts together with the mathematical myth always determines the truth of the maths-involving claims we use to describe the world. So we have (i). And the addition of a platonic heaven is consistent with any state of the actual world. This one gets the thumbs up!
 - ▶ Potential problems for (i) could include statements like "The size of the physical continuum is 2^{\aleph_0} ", whose truth may be underdetermined if our background set theory is first-order.
 - ▶ Besides issues stemming from mathematical fatalism, problems for (ii) would arise if you had a very heavy-duty platonist view. An example James Robert Brown's view, according to which our mathematical knowledge is causally explained by the interaction of our mind with objects in platonist heaven. On that view, our mental states and actions would not stay the same if there were mathematical entities acting on our minds.

B) *Antirealism about Electrons*. The macroscopic state of the world, together with a sensible theory of electrons, massively underdetermines the state of the electrons. So we have a disastrous failure of condition (i). This one gets the thumbs down!

- ▶ One way to avoid this would be to expand the domain of what are ordinarily thought of as macroscopic facts. In particular, you could include a lot of counterfactual/dispositional facts about macroscopic objects, such as “if I were to point a microscope right here, a bacterium image would appear on the screen.” This was essentially the strategy that many logical positivists used for dealing with such problems of underdetermination.

C) *Antirealism about Rainbows*. We have to be careful here about what it is we take rainbows to explain. But insofar as we are mostly just trying to describe what things look like from over here, our visual of the rainbow pretty much determines what’s going on with the fictional, solid rainbow-coloured arc in the sky (or what would be going on with it if such things really existed). And no matter where the rainbow apparently is in the sky, there is a possible world where such an arc occupies that location. So this one gets a cautious thumbs up!

- ▶ Not all rainbow talk is going to be captured this way. For instance, there won’t be a loose reading of “there’s a pot of gold at the foot of the rainbow” if our visual does not even determine where exactly that foot is supposed to be.
- ▶ The operative myth should say something like “all apparent rainbows are concrete rainbow-coloured arcs.” There is an issue about how to make this consistent, which creates trouble for (ii). Even in a possible world where there were these concrete physical rainbow-coloured arcs, there would also still be light and water droplets in the air — the combination of which would pretty much inevitably lead to the presence of “apparent rainbows”.

I’ll leave the other examples for you to decide!

Elliot’s Presentation on Moral Fictionalism via Logical Subtraction

Topics: Mackie vs. Dworkin; Moral Aboutness; Exculpation in Moral Language; Error Theory.

