

Gibb on Causal Completeness and the Conservation Laws

PHIL451 – Philosophy of Mind

Introduction

Papineau and Bennett, like all physicalists, accept the principle of the causal completeness (or ‘closure’) of the physical (i.e., ‘Completeness’). Traditionally, many have claimed that physical laws of conservation of energy and of momentum offer support for Completeness. Is this true? This is the issue Gibb addresses in her paper.

Recall Papineau’s Causal Argument for Physicalism (or Gibb’s reconstruction of it on p. 365)

1. Mental causes have physical effects. [Efficacy.]
2. Every physical effect has a sufficient physical cause. [Completeness.]
3. There is no systematic causal overdetermination. [No Systematic Overdetermination.]

Therefore:

4. Mental causes are identical with physical causes.

Introduction

To his credit, Papineau offers an argument for Completeness (in one of the optional readings for today: the Appendix of his 2002 book *Thinking about Consciousness*). It goes approximately as follows.

1. Every physical system is conservative, or is part of a larger system that is conservative (where a system is ‘conservative’ if its total amount of energy and linear momentum can be redistributed, but not altered in amount, by changes that occur within it). [Conservation]
2. Probably, there is no non-physical energy. [Energy]

Therefore:

3. Probably, every physical effect has a sufficient physical cause. [Completeness]

Notes on Premise 1 (Conservation)

In physics, 'energy' is:

- understood as the ability to do work.
- standardly treated as a quantity that is transferred to an object when the object is acted upon.
- measured in joules and comes in various forms (kinetic, potential, etc.).

'Linear momentum' is the quantity of motion of a moving object. The linear momentum of a moving object is equal to the object's mass times its velocity and is measured in kilogram meters per second.

Notes on Premise 1 (Conservation)

As Papineau observes, physical conservation laws, on their own, are *silent* about *what forms* of energy there are in the world (p. 196, cf. Brian McLaughlin's 'The Rise and Fall of British Emergentism'). They tell us only that the total magnitude of energy in the system is conserved with every transfer of energy.

Because no restrictions are placed on the kinds of energy present in the system, Conservation is (in principle) consistent with the existence of fundamentally non-physical (or 'psychic') energy.

Notes on Premise 2 (Energy)

Papineau offers two empirical arguments for the nonexistence of non-physical energy: the argument from fundamental forces and the argument from physiology.

- According to his “argument from fundamental forces”, we have strong inductive evidence that all high-level (“special”) forces and energy ultimately ‘reduce to’ lower-level physical forces and energy.
- According to the “argument physiology”, if fundamental (and so irreducible) mental forces and energy did exist, we would have found physiological evidence for their existence by now. We haven’t. So, such forces and energy likely don’t exist.

Assessing Papineau's argument: a preliminary

Gibb makes two main points about Papineau's argument.

The first point is that if Papineau's argument shows anything, it shows something *stronger* than that, probably, every physical effect has a sufficient physical cause (i.e., Completeness). In addition, it shows that, probably, no physical effect has a non-physical cause.

- Confusingly, given the Kim-inspired terminology that we saw Bennett using, Gibb calls the latter claim 'Exclusion.' To avoid any confusion with Bennett's (very different) exclusion principle, let's call the principle that Gibb has within her sights – that no physical effect has a non-physical cause – “Gibb-Exclusion”.

Assessing Papineau's argument: a preliminary

As Gibb notes (pp. 368-9), if she's right about what (if anything) follows from Conservation and Energy, it would recast the whole mental causation debate. Specifically, if one's evidence for Completeness is really evidence for (the stronger) Gibb-Exclusion, then the familiar causal argument for physicalism rests on a confusion.

- As we've seen, the causal argument exploits the plausible assumption that our actions aren't systematically overdetermined to derive the conclusion that the mental causes of behaviour are physical causes. But if one's reason for believing in Completeness is really a reason for believing in Gibb-Exclusion, then considerations about overdetermination contribute nothing to the argument for physicalism. This is because what one (allegedly) knows from Conservation and Energy is not only that every physical effect has a sufficient physical cause but also that it has no non-physical cause. With no non-physical cause for the physical cause to 'compete' with, concerns about overdetermination fall by the wayside.
- This is another reason why Gibb's choice of the term 'Exclusion' is unfortunate. Her point is, in a nutshell, that if one already has evidence for Gibb-Exclusion, then questions about systematic causal overdetermination aren't relevant to defending physicalism. But the term 'Exclusion' (as Kim, Bennett, and other philosophers use it) precisely refers to a thesis about causal overdetermination!

Assessing Papineau's argument: a preliminary

So, physicalists and dualists alike have reason to care about what follows from Conservation and Energy.

Assessing Papineau's argument: the main point

Gibb's second (and more central) point is that Papineau's argument is invalid. Here is that argument again, now reformulated to have Gibb-Exclusion rather than Completeness as its conclusion:

Assessing Papineau's argument: the main point

1. Every physical system is conservative or is part of a larger system that is conservative. [Conservation]
2. There is (probably) no non-physical energy. [Energy]

Therefore:

3. Probably, no physical effect has a non-physical cause. [Gibb-Exclusion]

Assessing Papineau's argument: the main point

A telling sign that this argument is invalid is that, while its conclusion is about causation, neither of its premises mention causation. For Gibb-Exclusion (and Completeness) to follow from Conservation and Energy, Gibb thinks we must add *at least* two other premises:

- Physical Affectability: The only way that something non-physical could affect a physical system is by (1) affecting the amount of energy or momentum within it, or (2) redistributing the energy and momentum within it.
- Redistribution: Redistribution of energy and momentum cannot be brought about without supplying energy or momentum.

As an exercise, try to work out how, exactly, Gibb sees Physical Affectability and Redistribution as bolstering the inference from Conservation and Energy to Gibb-Exclusion.

Assessing Papineau's argument: the main point

In the final section of the paper, Gibb explains why she thinks the case for Physical Affectability and Redistribution is not easy to make: neither is a claim of physics, nor does either clearly follow from any ironclad metaphysical principle about causation.

She does so by considering various proposals that would provide support for Physical Affectability and Redistribution ...

Proposal: Transference

Proposal: Let's supplement the causal argument with:

- Transference: causation is the transference of a quantity from cause to effect, where this quantity is energy or momentum. (This is an 'energy transference' theory of causation)

Gibb's reply:

- i) Now Conservation is redundant to the argument.
- ii) If we replace Conservation with Transference, we must still interpret the *scope* of Transference. If it is a claim about *physical* causation, then it won't get the physicalist to where they want to go (namely, Gibb-Exclusion). If it is a claim about causation *as such*, then the argument will assume what it claims to show: to justify the theory's generalization beyond its home case of physical causation to all of causation, we must appeal to Gibb-Exclusion.

Proposal: There is empirical support for Physical Affectability and Redistribution of which dualists are ignorant

- Gibb's reply: Neither Physical Affectability nor Redistribution are implied by anything in contemporary physics.
- Recall, too, that the evidence that Papineau marshaled in support of Energy (the argument from fundamental forces and the argument from physiology) is *irrelevant* to the truth or falsity of Physical Affectability and Redistribution: "A dualist who denies Physical Affectability will not understand psychophysical causation in terms of pushes and pulls" (p. 379). (Likewise for Redistribution).

Proposal: Psychophysical causation becomes unintelligible if we deny Physical Affectability (and possibly Redistribution).

- Gibb's reply: If the kind of understanding you desire is that which comes from being shown a *mechanism*, then this returns us to Transference or something similar. However, many accounts of causation reject the demand for a mechanism in the desired sense. (Gibb mentions a few familiar options: nomological/regularity theories and counterfactual dependence theories. She also mentions another option which we will discuss more next time).
- Contemporary regularity theories build on Hume's claim that causation is a matter of 'constant conjunction'. A crude (i.e., enormously simplified) regularity theory might assert that event c causes event e iff c is of some type A and e is of some type B and B-type events reliably follow A-type events. A famous example of this approach is Mackie's theory of causation as an 'INUS' condition: i.e., an insufficient but necessary part of an unnecessary for sufficient condition for an event of a certain type to occur. A crude version of a counterfactual dependence theory asserts that Event c causes event e iff had c not occurred, e would not have occurred. David Lewis is a famous exponent of the counterfactual approach.