

PHILOSOPHY 4360/5360 – METAPHYSICS

Laws of Nature – Handout 2

Topic X. Laws of Nature: Realist Versus Reductionist Views

Lewis-laws and Barry Loewer on Our Philosophical Expectations Concerning Laws of Nature

Barry Loewer sets out a “list of the most important features that laws are supposed to have” – that is, a list of propositions formulating what are widely held to be necessary truths about laws – and then he argues that, while Lewis-laws (L-laws) do not make all of those propositions true, they do a better job in this regard than any alternative account of the nature of laws. Does Loewer succeed in doing this? Let’s consider each of the propositions on Loewer’s list.

(1) “If it’s a law that *Fs* are followed by *Gs*, then it is true that *Fs* are followed by *Gs*.”

Loewer: This is clearly satisfied by Lewis-laws.

Comment: Since Lewis-laws are identical with certain regularities, this is unproblematic.

(2) “Being a law is a mind-independent property.”

Loewer: “It is arguable that L-laws satisfy condition (ii).”

Admittedly, using “standards of simplicity, strength, fit, and balance” in defining L-laws, the procedure “smells, at least a little, like nomic idealism.” (191). But “it is not clear that being an L-law is mind dependent is troubling in any way for the jobs that laws are required to play in science.” (191)

Comment: If there is no weighting of simplicity versus strength that is objectively correct, then there will be possible worlds where whether some regularity gets classified as a law of nature will depend on one’s choice of a weighting of those two factors. That certainly seems to imply that there is no objective fact concerning what the laws are in such a world, and that seems objectionable

(3) “The laws are important features of our world worth knowing.”

Loewer: Lewis-laws “seem” to satisfy this thesis.

Comment: Is it true that knowledge of L-laws would be important knowledge? I’m inclined to think that the answer depends on whether thesis (8) is satisfied. For how important would knowledge of L-laws be if L-laws **did not support counterfactuals**?

(4) “It is a goal of scientific theorizing to discover laws, and we have reason to believe that some of the propositions that the fundamental sciences classify as laws are laws.”

Loewer: Lewis-laws “seem” to satisfy this thesis.

Comment: Is it true that physics is attempting to discover L-laws? It may well be true that physics is attempting to discover things that are **at least** L-laws. But if it turns out, as I shall be suggesting below, that L-laws do not draw the line between nomic generalizations and accidental generalizations in the right place, then there may well be L-laws that are of **no scientific interest at all**, and then it is false that science is interested in L-laws **as such**.

(5) “There is a distinction between lawful generalizations and accidental generalizations.”

Loewer: This is clearly satisfied by Lewis-laws.

Comment: Loewer’s contention that L-laws satisfy thesis (5) is true, but it is far from clear that L-laws correctly classify generalizations into nomological generalizations and accidental generalizations.

Here are two reasons for thinking that they do not:

(a) The case of the extremely informative generalization that everything that is not red lacks a certain complex property *P*.

(b) The “critical mass” objection: the dependence of Lewis-laws upon precisely how many things have a certain property.

(6) “There are vacuous laws.”

Loewer: This is clearly satisfied by Lewis-laws.

Comments: Loewer’s contention that L-laws satisfy thesis (6) is true, but there is a very important **modal** thesis that is stronger than (6), which Loewer does not discuss:

(6*) It is possible for there to be **basic** laws that have no instances.

Lewis-laws do not satisfy thesis (6*). But are there any reasons for thinking that thesis (6*) is true? Elsewhere, I have offered two related arguments in support of the thesis that there can be basic laws that have no instances:

(a) The case of two types of particles that, by accident, happen never to meet.

(b) The case of primordial Snoopy, the purple flower, and the untimely asteroid.

A variant on the Snoopy case would be one where evolution leads to the development of red/green cones in the eye, but no blue/yellow cones.

In addition, if one reflects on the variety of qualia that one can experience, one might think that the following **non-modal variant of (6*)** is probably true:

(6**) The actual world contains **basic** laws that have no instances.

For how likely is it that evolution has led to the development of organisms that are capable of being in all of the neurophysiological (or other types of) states that give rise to different types of qualia?

(7) “Laws are contingent but ground necessities.”

Loewer: It is “controversial” whether Lewis-laws satisfy thesis (7).

Comment: It is hard to know what to say about this thesis. If the relevant sense of necessity is to be defined in terms of the concept of a law, then the thesis becomes a trivial one. But if Lewis-laws are not laws, then Lewis-necessity is not necessity in the relevant sense. Moreover, if Lewis-laws do not correctly draw the distinction between laws and accidentally true generalizations, then they will not satisfy thesis (7).

(8) “Laws support counterfactuals.”

Loewer: It is “controversial” whether Lewis-laws satisfy thesis (8).

Comments on Thesis (8)

1. What does it mean to say that laws support counterfactuals? One interpretation is that laws **entail** counterfactuals – which they will do on certain standard accounts of the meaning of counterfactuals.

2. But I think that the crucial idea here is that if it is a law that F are G s, then no counterfactual of the following form is true:

“If X were an F , then it would not be a law that all F s are G s.”

(Contrast the situation in the case of generalizations that are only accidentally true.)

3. Loewer points out that L-laws do not always support counterfactuals when the latter are interpreted in a Stalnaker/Lewis fashion, since the most similar world in which something that is not an F in the actual world is an F might be a world where it is not a law that all F s are G s. (189)

4. What if counterfactuals are not interpreted in a Stalnaker/Lewis fashion? Then it seems to me that one has no ground for asserting the following claim:

“If it is an L-law that F are G s, then no counterfactual of the following form is true:

If X were an F , then it would not be a L-law that all F s are G s.”

Tentative Conclusion

It doesn’t look as if L-laws satisfy thesis (8).

(9) “Laws explain.”

Loewer: It is “controversial” whether Lewis-laws satisfy thesis (9).

Comments on Thesis (9)

1. The crucial sense of explanation here, I think, is one where p explains q only if p provides a reason why q is true. Given this sense, however, Lewis-laws do not explain **the corresponding regularities**.

2. In contrast, metaphysically more robust views of laws – including the view that laws are certain second-order relations between universals – do explain why the corresponding regularities obtain.

(10) “Laws are confirmed by their instances.”

Loewer: This is satisfied by Lewis-laws.

Comment: Using either Carnapian inductive logic, or some standard formula for the probability that the next F will be a G , given that n F s have been G s, one can show that the probability that all F s will be G s, given that there are an infinite number of F s, and given that there is no atomic state of affairs that entails that all F s are G s, will be **infinitesimally close to zero**.

In the case where the only possibilities are that something either has property F or lacks it, Carnap’s formula agrees with Laplace’s famous Rule of Succession, according to which if it is true that n F s have been G s, the probability that the next F is a G is equal to $\frac{n+1}{n+2}$.

(11) “The success of induction depends on the existence of laws.”

Loewer: If an approach to induction is successful only if it can rule out ‘inductive skepticism’, then no approach to induction can succeed:

If ‘inductive skepticism’ means that it is impossible to provide a non-question-begging justification of a system of inductive inference, then I agree with Armstrong’s claim that Humeanism makes inductive skepticism inevitable. That is because it is *inevitable period*, whatever laws may be. Hume conclusively showed the impossibility of a non-question-begging justification of any universal system of inductive inference. (190)

Construed in some other, less demanding way, however, Lewis-laws will satisfy thesis (11).

Comments on Thesis (11)

1. Hume did not consider the possibility either of **logical relations of probabilistic support between propositions**, or of laws of nature that are **atomic states of affairs that logically entail corresponding regularities**. Given his failure to do so, Hume could not possibly have “conclusively showed the impossibility of a non-question-begging justification of any universal system of inductive inference.”
2. It may be, then, that inductive skepticism can be refuted if, and only, if laws of nature are viewed as atomic states of affairs that consist of second-order relations between properties.

(12) “The laws guide (direct, constrain, or probabilistically guide) the evolution of events.”

Loewer: The metaphorical claim that is expressed by (12) need not be satisfied in order for something to be a law, since the “metaphor is obscure and not obviously connected with actual scientific practice.” (187). In any case, Lewis-laws do not satisfy thesis (12):

But whatever the metaphors come to it is clear that L-laws don’t govern the evolution of events. It is more apt to say that L-laws *summarize* events. (192)

Comments on Thesis (12)

1. The crucial non-metaphorical part of thesis (12) seems to me to be that laws are **ontologically more basic** than particular events.
2. Given that claim, then laws together with the conditions that exist at any time t determine the likelihood of any later event.
3. On this interpretation, there is nothing “obscure” about thesis (12), contrary to what Loewer claims.
4. The claim that laws are ontologically more basic than particular events is, however, an anti-reductionist thesis, and so it might be claimed that thesis (12) is question begging. But I do think thesis (12) is part of our ordinary **concept** of laws: laws, rather than being patterns in events, are things that determine what patterns there will be.

(13) “If it is a law that p , and q is any proposition expressing boundary or initial conditions relevant to the law that are co-possible with p , then it is possible [both] that it is a law that p and [that] q [is also the case].” (187)

Discussion

Loewer’s formulation of thesis (13) is a bit careless, and, as a result, it suffers from ambiguity. But thesis (13) is a modal thesis, and what it says is that for any law L , and any boundary or initial condition C that is compatible with L , then there is a possible world where C is true and where L is a law.

Comments

1. Thesis (13) is related to the “simple universes” type of objection that John Carroll and I have directed against various reductionist accounts of laws.
2. Using “simple universe” cases it can easily be shown that Lewis-laws do not satisfy thesis (13). For example, it would seem that there could be a Newtonian universe with only a single particle. Since there would be no acceleration in that world, Newton’s Second Law of Motion – $F = ma$ – would not be a Lewis-law, since the regularity would not be part of the system that best combined simplicity and strength.
3. Loewer admits that the failure of L-laws to satisfy thesis (13) is a serious objection to the view that L-laws are laws:

The failure of L-laws to satisfy (xiii) is prima facie a serious matter.

The feeling that an adequate account of laws should satisfy (xiii) runs deep. (192)

4. Loewer’s response to the sort of argument that Carroll and I have advanced involves questioning the authority of the intuitions in question:

The assumption that such intuitions are accurate is, at best, questionable and in some cases has been outright discredited. For example, most people have the intuition that continued application of force is required to keep a body in motion and that the heavier an object, the faster it falls. Obviously these intuitions are misguided. Why should intuitions concerning laws be more reliable? (193)

5. The types of intuitions involved in the two cases are, however, completely different. The intuitions about forces and motion are intuitions concerning **contingent facts about the world**. The intuitions that Carroll and I appeal to are intuitions concerning our **concepts**.

6. In footnote 47, Loewer says, "The view that our intuitions involving a concept must be satisfied by the concept's reference may rely on a certain view of concepts and intuitions." But Carroll and I are concerned only with the concept of laws, and view it as a completely separate question whether there is anything in the world that answers to that concept. So neither of us is making any use of the view that Loewer refers to here.

Summing Up

1. Lewis-laws satisfy condition (1), and they may satisfy condition (7).
2. Lewis-laws satisfy condition (5), but they do not satisfy a strengthened version of (5), in that they do not appear to classify generalizations correctly into nomic generalizations and accidental ones.
3. Similarly, Lewis-laws do satisfy condition (6), but they do not satisfy the related **modal** thesis (6*), or the **strengthened**, and probably true **non-modal** thesis (6**)
4. Lewis-laws do not support counterfactuals in the crucial sense, and so do not satisfy condition (8).
5. Lewis-laws do not explain why cosmic regularities obtain, and so do not satisfy condition (9).
6. Lewis-laws are not confirmed in the crucial way by their instances, and so do not satisfy thesis (10).
7. Lewis-laws provide no basis for a justification of induction, and so do not satisfy condition (11). Loewer is mistaken in embracing inductive skepticism.
8. Lewis-laws, as Loewer agrees, do not satisfy conditions (12) and (13).
9. Lewis-laws do not satisfy condition (3), since they would satisfy condition (3) only if Lewis-laws supported counterfactuals, which they do not do.
10. Lewis-laws do not satisfy condition (4) unless Lewis-laws correctly classify regularities as nomological and accidental, and there is reason for thinking that they do not do so.
11. Lewis-laws do not fully satisfy condition (2), and it is arguable that the partial satisfaction is not enough.