

LAWS OF NATURE

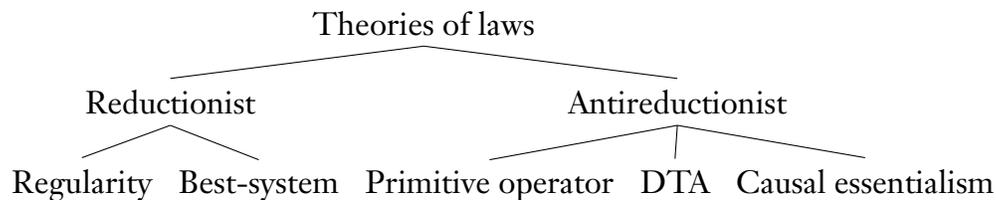
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Properties seminar

Quidditism Properties are prior to laws. What a property is does not involve the laws in which it figures. Fundamental facts about fundamental properties do not involve laws. There are fundamental facts about properties that do not involve laws. The same properties could have figured in different (or no) laws.

Causal essentialism Properties are not prior to laws. What a property is involves the laws in which it figures. Fundamental facts about fundamental properties involve laws. The same properties could not have figured in different (or no) laws.

1. Crash course on natural necessity

Concepts of natural necessity: law, cause, counterfactuals, chance. A common approach, but not the only one, defines the others in terms of lawhood. E.g., the “covering law” theory of causation: one event causes another iff there is a law that implies that every event like the first is followed by some event like the second.



2. Regularity theory

Regularity theory A law is a true regularity. A regularity is a sentence of the form “All F s are G s”, where F and G are suitable predicates.

“Suitable” means something like: “purely qualitative”. Problems:

- *Qualitative descriptions of single-cases:* Let F be a qualitative predicate that just happens to apply to all and only those people in the room right now.

Then “All *F*s are thinking about philosophy” will be a true regularity, but not a law.

- *Gold/uranium example*: “Every solid lump of gold is less than 1 million pounds” isn’t a law, but “Every solid lump of Uranium 235 is less than 1 million pounds” is (let’s suppose). It’s hard to think of a definition of ‘suitable’ that would exclude one but not the other.
- *Explanation, etc.*: Laws explain, support counterfactuals, etc.; mere regularities allegedly don’t.

3. Best-system theory

I adopt as a working hypothesis a theory of lawhood held by F. P. Ramsey in 1928: that laws are “consequences of those propositions which we should take as axioms if we knew everything and organized it as simply as possible in a deductive system”. We need not state Ramsey’s theory as a counterfactual about omniscience. Whatever we may or may not ever come to know, there exist (as abstract objects) innumerable true deductive systems: deductively closed, axiomatizable sets of true sentences. Of these true deductive systems, some can be axiomatized more *simply* than others. Also, some of them have more *strength*, or *information content*, than others. The virtues of simplicity and strength tend to conflict. Simplicity without strength can be had from pure logic, strength without simplicity from (the deductive closure of) an almanac... a contingent generalization is a *law of nature* if and only if it appears as a theorem (or axiom) in each of the true deductive systems that achieves a best combination of simplicity and strength. (Lewis, 1973, p. 73)

Also: the language of these theories must have predicates only for perfectly natural properties. Some points about the theory:

- Avoids the first two problems because it doesn’t say “every true statement of such-and form” is a law. Whether something counts as a law depends on what it contributes to the overall set of laws.
- Some say that Lewis-laws are just glorified regularities, and thus can’t explain, etc.

4. The primitive operator theory

Nonextensional operator “It is a law of nature that ϕ ” part of primitive ideology.

5. The Armstrong/Dretske/Tooley theory: laws as relations between universals

Suppose it to be a law that Fs are Gs. F-ness and G-ness are taken to be universals. A certain relation, a relation of non-logical or contingent necessitation, holds between F-ness and G-ness. This state of affairs may be symbolized as ‘N(F,G)’. (Armstrong, 1983, p. 85)

It’s often claimed that this view is needed to solve the problem of induction:

It is unclear what could justify accepting a mere generalisation (even one with pragmatic or epistemological trappings) short of checking all of its instances, for if laws merely record regularities, why should the fact that two properties have been found to be coinstantiated or to be instantiated in succession be thought to tell us anything about unobserved cases? Yet if a sentence telling us that all Gs are Fs is regarded as ‘lawlike’, we often feel justified in accepting it after observing just a few positive instances. This practice would seem to be warranted only if there is something about a thing’s being G that at least makes it probable that it is also F. And the property theory nicely accounts for this, for if g bears the [N] relation to f, the second property will accompany the first in all cases, allowing us to make predictions about unexamined instances as well as to confirm a generalisation about all of them. Swoyer (1982, pp. 208–9)

But why do the observed cases justify belief in the law?

Lewis’s objection to the view:

Whatever N may be, I cannot see how it could be absolutely impossible to have $N(F, G)$ and Fa without Ga . (Unless N just is constant conjunction, or constant conjunction plus something else, in which case Armstrong’s theory turns into a form of the regularity theory he rejects.) The mystery is somewhat hidden by Armstrong’s terminology. He uses ‘necessitates’ as a name for the lawmaking universal N ; and who would be surprised to hear that if F ‘necessitates’ G and a has F , then a must have G ? But I say that N deserves the name of ‘necessitation’ only if, somehow, it really can

enter into the requisite necessary connections. It can't enter into them just by bearing a name, any more than one can have mighty biceps just by being called 'Armstrong'. (Lewis, 1983, p. 366)

The ultimate antireductionist complaint (about either the DTA theory or the primitive operator theory) is that the posited extra facts are unexplanatory, since no mechanisms are supplied for the alleged sense in which they “guide” or “govern” the world.

References

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