

The Bookkeeper and the Lumberjack: Metaphysical vs. Nomological Necessity

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1. NOMOLOGICAL NECESSITY

Consider the anti-Humeans' claim that for $\forall x(Fx \rightarrow Gx)$ to be a law (or to be backed up by a law) there has to be a certain *Must* that is operating: Fs have to *bring about* or *produce* or *necessitate* Gs. Armstrong's version of this claim is to invoke *nomological necessity*, a relation that is supposed to hold between the two universals F and G— $N_{\text{nom}}(F, G)$ —and, therefore, makes it the case that each instantiation of F is, or brings about, a G-instantiation.

Nomological necessity is meant to be a *this-worldly, immanent* relation that does not extend to other possible worlds: *per se*, the *Must* of nomological necessity, $N_{\text{nom}}(F, G)$, does not bring "truth in all possible worlds" with it. It is rather to be thought of as something like a *force* operating here and now. In the lack of a better neutral technical term let's call it an *oomph*. Whether *oomphs* are to be found in other worlds and, if so, are linking the same properties as they do actually is open for discussion in Armstrong's view. Therefore, the opposite of nomological necessity should not be conceived as contingency. Rather, it is the lack of *oomph*.

Naming the relation "necessity" suggests, of course, the following semantic link: that Fs nomologically *necessitate* Gs means that it is *not possible* for Fs *not to be* Gs. Does this link then reveal a hidden connection to possible world considerations? It doesn't. We have to read the term *nomological possibility* as this-worldly as we read its necessary counterpart. That something is *nomologically possible* simply means that there is no *oomph* operating against it in the actual world.

The force character of nomological necessity is also underlined by the guise in which it appears and how it is supposed to operate in the actual world. Remember, nomological necessity is, in itself, a second order relation between universals and has, therefore, *prima facie* not an immediate bearing on what is happening in this world. Yet, latest in his *A World of States of Affairs* (David Armstrong: *A World of States of Affairs*, Cambridge 1997) Armstrong explains how it operates: the nomological relation between universals is instantiated as causation. Just like the universals F and G have their instantiations in F-tokens and G-tokens so has the nomological necessitation universal its instantiation as causation between those tokens. Furthermore, Armstrong argues for the observability of (some instances of) causation. His paradigm case is pressures on our bodies. I will question neither of the two last features of causation *cum* nomological necessity and simply take them for granted.

This is, then, where we stand so far:

Nomic connection can be understood as the sort of connection actually encountered in certain cases of singular causation. (Armstrong 1997: 232).

Singular causation is no more than the instantiation of this type of relation in particular cases. When we experience singular causation, *what* we are experiencing is nomicity, law-instantiation. (Armstrong 1997: 227)

2. Modal Nomological Necessity

No doubt, there is a certain temptation to use nomological necessitation as an optical device to get a glimpse of other worlds. Especially, when we consider counterfactual situations: “had there been a magnetic field the electron's trajectory would have been different”. This claim, so we think, is supported by the laws of nature, i.e., in the theory under scrutiny, by nomological necessity. However, we forget too quickly that this reasoning is elliptical for “*assuming our laws of nature hold*, had there been a magnetic field the electron's trajectory would have been different”. We might have some sort of entailment in mind: the law statements plus the description of the field entail a different motion equation for the electron. Someone who confuses nomological necessitation with a kind of (if a little weaker) metaphysical necessitation would not need the tacit supposition “*assuming our laws of nature hold*”. Armstrong, and other proponents of nomological necessitation, do need it. In short, nomological necessitation does not *by itself* extend to counterfactual situations. We have to carry it with us. Here is one canonical possibility of how to do this:

We can define a kind of possible worlds necessity, call it *modal nomological necessity*, on the basis of nomological necessity. Van Fraassen (Bas van Fraassen, *Laws and Symmetry*, Oxford 1989, 44) gives us a recipe for this purpose for Lewis's account of laws of nature which we can easily turn into a recipe for a nomological necessity account of laws.¹ Define *modal nomological possibility* in the following way:

World *y* is *modally nomologically possible* relative to world *x* iff the laws of *x* are laws in *y* and vice versa (i.e., nomological necessity links the same universals in *x* and *y*).

We get the notion of *modal nomological necessity* as a by-product:

“*It is modally nomologically necessary that A*” is true in world *x* iff *A* is true in every world which is *modally nomologically possible* relative to *x*.²

The argument has the following general form: knowing that $N_{\text{nom}}(F, G)$ holds is a very good reason for us to claim that the counterfactual “were this *x* an *F* it would be a *G*” is true. In other words, we recommend that $N_{\text{nom}}(F, G)$ being the case should be accepted as a justification for the respective counterfactual claim.

3. Interlude: Nomological Necessity and the *A priori*

I now come to a brief remark concerning the *a priori*. It has often been argued that by liberating the *necessary* from the *a priori* and, along with this move, by being able to give *necessity* its own, separate meaning Kripke has paved the way for anti-Humean nomological necessity approaches to the laws of nature. Consider, for example, Stathis Psillos:

It was Kripke's liberating views in the early 1970s that changed the scene radically. By defending the case of necessary statements, which are known a posteriori, Kripke [1972] made it possible to think of the existence of *necessity in nature* which is weaker than logical necessity, and yet strong enough to warrant the label necessity. [...] As a result of this, the then dominant view of laws as mere regularities started to be seriously challenged. (Stathis Psillos, *Causation and Explanation*, Chesham 2002, 161; my italics)

¹ In fact, this recipe is applicable to any notion of lawhood that does not itself dependent on modal considerations.

² Laws are trivially modally nomologically possible according to these definitions: let *L* be a law of *x*. “*L* is a law” is true in every world *y* which is possible because the same laws are laws in *y* as in *x* *qua* definition of *modally nomologically possible*.

Now, if, in Psillos' statement, "*natural necessity*" is meant to be Kripke's *metaphysical necessity* then (as it has been shown above) it has nothing much to do with Armstrong's *nomological necessity*. Rather, it would then relate to the theory I will deal with next, namely *essentialism*. Yet, this movement came into fashion too late to speak justifiably of Kripke changing the scene radically in the early 1970s. Indeed, in that case, the harvest of Kripke's seed showed up rather late.

However, if Psillos means to refer with "*necessity in nature*" to a kind of Armstrongian *nomological necessity* then the comparison to *logical necessity* is misplaced: as underlined above, *nomological necessity* has, *per se*, nothing to do with this kind of possible world necessity and is neither weaker nor stronger.

Hence, Kripke's authority turns out to be limited. His influence has to be thought of as psychological rather than philosophical: Kripke has opened people's minds for connections in nature which have been banned from philosophy since Hume, fair enough, but he did not yet come up with the kind of necessity Armstrong and others have envisaged for laws of nature.

4. Essentialism and Metaphysical Necessity

So far, it has been argued that the *Must* the opponents of regularity theories (here Armstrong) take to be essential for laws is not the *Must* of "truth in all metaphysically possible worlds" but rather the *Must* of causation (*oomphs*). Yet, this other *Must*, i.e., metaphysical necessity, is the one the *new essentialists* see figuring in their laws:³

Essentialists have their own special brand of necessity. This kind of necessity has traditionally been called "metaphysical necessity". [It] might also be called "physical necessity", or "natural necessity". [...] A better name would be its classical Latin name, "*de re* necessity", which might reasonably be translated as "real necessity". (Brian Ellis, *The Philosophy of Nature*, Chesham 2002, 110)

And here is the equation of metaphysical (or *real*) necessity with truth in all possible worlds:

Real necessity is no less strict than any other kind of necessity. [...] If essentialists are right, and the laws of nature are really necessary, then they must be counted as necessary in the very strong sense of being true in all possible worlds. *Truth in all possible worlds is the defining characteristic of all forms of strict necessity.* (Ellis 2002: 110; my emphasis)

"Water is H₂O" is a necessary proposition in the strict sense of being true in every possible world. (Ellis 2002: 110)

I will not go into details regarding the nature of metaphysical necessity. I simply appeal to the readers' Kripke-trained intuitions which have been rehearsed over and over again with, for example, the above mentioned "Water is H₂O" case. The equation of metaphysical necessity with truth in all possible worlds is what solely matters for my purposes.

5. Does the Essentialist Lose the *Oomph*?

Putting together what has been said so far reveals that if the essentialists were only to replace the nomological necessity of laws by metaphysical necessity— $N_{\text{met}}(F, G)$ instead of

³ I will focus on Brian Ellis's writings. However, next to Sydney Shoemaker, Charles Martin, George Molnar, Nancy Cartwright and John Heil he lists in his *The Philosophy of Nature* (Ellis 2002) many more followers of the *new essentialism*.

$N_{nom}(F, G)$ —then they would lose the intra-world *Must*.⁴ The pure change from nomological necessity to metaphysical necessity, which is very often perceived as a strengthening, would therefore be, in some sense, a weakening. In fact, the essentialist would, somehow, fall back into Humean metaphysics. The Humean mosaic of unrelated properties and accidental regularities is now just bigger: it expands from our world to all possible worlds. Within each of those worlds, however, Fs do not bring about, do not produce, or cause Gs. In short, at this point, essentialists would lose their *oomph*; a loss they would not want to accept.

How do they get it back in? The following quote reveals what is no secret for those familiar with the essentialism debate:

For an essentialist, causation is not essentially an illusion resulting from habits of thought, as it is for a Humean. There are genuine *causal powers* in nature of greater or less strength, acting on various kinds of thing, and producing many different kinds of effects. (Ellis 2002: 106; my italics)

In other words, the essentialists push the *oomph* into their properties. That is, they argue that (at least some) properties are *causal powers*. That means, $N_{met}(F, G)$ is not enough of a replacement for $N_{nom}(F, G)$. Also, G has to make room for a disposition D which would, in this case, be the power (*oomph!*) to bring about or cause G if certain circumstances, C, are met:

What we think of as a causal power occupies the role of driving force in a causal relation. (Ellis 2002: 65)

The causal processes that are involved in the detailed explanation of a given disposition will all have the same kind of structure. Each will be characterizable by the kind (or kinds) of circumstances C that *would* trigger or instantiate the action, and the kind (or kinds) of outcome(s) E that *would* (or would with probability *p*) result, *provided that there were no interfering or distorting influences*. (Ellis 2002: 77)

Again, there are at least two replacements to be made if we want to change Armstrong's theory of laws gradually into Ellis' theory: N_{Met} for N_{nom} and *D* for *G*. $N_{met}(F, D)$ is then the ultimate short form of the new essentialist's credo: natural kinds, such as *F*, have their powers, such as *D*, essentially, i.e., it is *metaphysically necessary* that *F*s have the *causal power D*. Compare this short form to a lengthier statement:

Today's essentialists suppose that the basic dispositions of things to interact with each other in the way in which they do derive from the intrinsic causal powers, capacities and propensities of their most fundamental constituents. They suppose that these causal powers, and the like, are among the essential properties of things of these kinds, and therefore properties that things of these kind have necessarily, since they could not possibly fail to have them, while yet being things of these kinds. (Ellis 2002: 13)

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⁴ Note that $N_{met}(F, G)$ is not really a valid way to formalize the shift. Metaphysical necessity, N_{met} , is a property of propositions (or facts, or states of affairs, or whichever you prefer). It is not a relation which can be attributed to ordered pairs of universals. To resolve the trouble we can, at least as a working hypothesis, turn to the respective regularity statements and apply the necessity operator to them: $N_{met}(\forall x(Fx \rightarrow Gx))$. As a matter of convenience, I will nonetheless allow myself to write $N_{met}(F, G)$ where no confusion can arise. (I also ignore worlds in which only one or none of the universals F and G exists.)

It is interesting to note that laws, in the essentialists' view, occupy quite a different role from the one they played in Armstrong's theory. For the essentialist, laws are somehow condemned to do the bookkeeping: the sum of them is the world's inventory list which tells us in which natural kind (or universal) we find which disposition (or, metaphorically speaking, in which box we find which tool). There is no messing about, fair enough: the inventory list is stone engraved, that is, the laws are metaphysically necessary. Bookkeepers, however, are no men of action (they are lacking the appropriate muscles). Clearly, someone else has to do the hard work: the cutting, pushing, chopping, tearing. But we know who now fulfills this role—that is, the lumberjack's role—: dispositions.

7. Do the Powers have Modal Force?

I have already lined out how we can get a modal force from Armstrong's nomological necessity—a feature this kind of necessity does not have *per se*. My argument was that $N_{\text{nom}}(F, G)$ actually being the case is a sufficient reason to assume that if something were an F it would also be a G. $N_{\text{nom}}(F, G)$ justifies this kind of counterfactual reasoning, every hundredth F accidentally being G would not.

Can a similar force be extracted from the dispositionalist's powers? Very easily!⁵ We are concerned with the question whether the counterfactual “if this thing had the disposition D and were triggered with C it would react with G” is supported by the essentialists' story about dispositions. And of course it is, simply because dispositional predicates entail counterfactual conditionals of precisely the required kind qua their meaning.

Note that this is an uncontroversial claim about dispositional predicates whether you are a realist about dispositions or not. Maybe you want to add that the counterfactuals also entail the disposition and that therefore dispositions are reducible to counterfactual conditionals, or maybe you want to say that dispositions are irreducible and basic.⁶ Clearly, no-one can deny the link pointing from the predicate to the counterfactual.⁷ Remember Ellis:

Each [disposition] will be characterizable by the kind (or kinds) of circumstances C that *would* trigger or instantiate the action, and the kind (or kinds) of outcome(s) E that *would* (or would with probability *p*) result, *provided that there were no interfering or distorting influences*. (Ellis 2002: 77)⁸

⁵ Remember that, here, we are not concerned with the essentialists' claim that some properties' possession of some powers is *metaphysically necessary*: ($N_{\text{met}}(F, G)$). For that case it is agreed that we get the modal force for free because metaphysical necessary simply *is* truth in all possible worlds.

⁶ David Lewis aims for such a reduction to counterfactuals (cf. David Lewis: *Finkish Dispositions*, in: *Philosophical Quarterly* 47 (1997), 143-158) where Ellis insists that the counterfactual entailed by a dispositional predicate serves, at best, as a rough characterisation of the disposition (cf. Ellis 2002: 76-7, 79). The counterfactual captures a symptom of the disposition, not its essence.

⁷ In pre-philosophical discourse we often want to draw attention to the truth of counterfactual conditionals when we attribute dispositions to objects. Think of the label “Fragile” on carton boxes. It is supposed to imply: “Handle with care because if you don't the content will break”.

⁸ I ignore Ellis's addendum “*provided that there were no interfering or distorting influences*”. It is, however, clear that there is a bomb ticking under the cover of proviso clauses like this.

Hence, if the essentialists describe something as having the disposition D to G if C-ed they are not only postulating causal *oomphs* but they thereby provide us with an analytical inference ticket to counterfactual reasoning. Both the *oomph* and the permission for counterfactual reasoning (which had to be added as an extra to Armstrong's theory) is condensed into the disposition. In short, saying that something x has disposition D is saying that counterfactual reasoning is justified *because* x has the respective causal *oomph*.

I conclude that whichever of the two theories we prefer, Armstrong's or Ellis's, we can extract our modal force from a supposed intra world causal connection. Earlier, I called this modal force "*modal nomological necessity*".

8. Where do we go from here?

If my considerations are correct we have gained a modal concept different from and competing with the original Kripkean necessity: we have *metaphysical necessity* and we have *modal nomological necessity*.

A natural sequel to this paper would start to compare features of the two modal necessities. However, at this place is only room left for a brief outline of these features which could guide such an enquiry:

- We might want to argue that *modal nomological necessity* deserves the title of a "*necessity in nature*" (i.e., a *de re* necessity) more than the Kripkean necessity for it is based on causation where the latter is partially dependent on our intuitions about reference.
- According to Armstrong, the instantiation of nomological necessity is causation and causation can be felt or observed in certain cases. Metaphysical necessitation, on the other hand, is, although discovered *a posteriori*, not directly observable. It remains theoretical to a large extent. The necessity of water being H₂O goes unnoticed.
- Due to its bookkeeping nature Kripkean metaphysical necessity has similarities to analyticity (*de dicto* necessity). Analyticity keeps meanings in order, metaphysical necessity mirrors this semantic feature *in nature*. The modal correlate of nomological necessity, on the other hand, arranges the temporal order of events.
- Following the last point, it becomes obvious that there is a temporal succession or a diachronic component in modal nomological necessity which metaphysical necessity lacks. The later is a static, synchronic business.
- Finally, there are two features linked to both dispositions and causal relations which seem to be irreconcilable with modal forms of necessity: some dispositions and some causation is *probabilistic*, and, worse, there is the infamous problem of *proviso clauses* related to causation and dispositions: the power manifests if triggered "*provided that there [are] no interfering or distorting influences.*" (Ellis 2002: 77) Modal necessity, in contrast, does not allow for provisos.