ARMSTRONG ON THE ROLE OF LAWS IN COUNTERFACTUAL SUPPORTING†

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ABSTRACT: Armstrong (1983) poses two requirements that law-statements must satisfy in order to support the corresponding counterfactuals. He also argues that law-statements can not satisfy one of these requirements if they merely express regularities, although both requirements are satisfied if law-statements are interpreted as expressing relations between universals. I try to show that Armstrong's argument can be raised against Armstrong's own solution by adding three premisses to it: the inference thesis, the contingency thesis and a principle whose rationality I also argue for. Finally, I offer a more reasonable alternative condition for nomic counterfactual supporting which is satisfied by law-statements if they are interpreted as expressing relations between universals, but not so if we interpret them as mere regularities.

Keywords: Laws of nature, counterfactual conditional.

According to Armstrong, for law-statements like

(0) It is a law that all *Fs* are *Gs*

to support counterfactuals like

(1) If *a* were *F*, then *a* would be *G*,

they must satisfy two conditions. First, the conjunction of the law-statement with the fully stated antecedent of the counterfactual must logically imply the consequent of the counterfactual. Second, the assumption that the antecedent of the counterfactual is true must not bring into doubt whether, in this new-thought situation, the consequent is true.[1] Armstrong argues that this second condition is precisely the one that regularity-statements do not satisfy. Let us see how his argument goes.

Regularity-statements, like

(2) All *Fs* are *Gs*,

assert that the extension of *F* is included in the extension of *G*. The truth-maker of (2) is a complex state of affairs like $Fa_1\&Ga_1..Fa_n\&Ga_n$. The counterfactual assumption of (1) has an effect on the extension of *F*, so in the assumed situation that we consider for evaluating the counterfactual, *F* has no longer the same extension it had in the actual world. But if the extension of *F* varies, then we have good reasons to bring into doubt that the relations it held with other extensions still hold. We have good reasons, particularly, to bring into doubt that the extension of *F* is included in the extension of *G* and, hence, we have good reasons to doubt that (2) still holds. Accordingly, regularity-statements like (2) violate the second condition posed by Armstrong.

Armstrong maintains that this trait of regularity-statements is not displayed by the statements that affirm that a certain second-order nomological relation holds between two universals. According to the theory of laws as relations between universals, which Armstrong endorses -henceforth, (LRU)-, the truth-maker of the law-statement (0) is a relational state of affairs. In this view, the content of (0) is more naturally expressed by

(3) $N(F,G)$,

where *N* is the second order nomological relation in question. In contrast with the relation of extensional inclusion, *N* does not reduce to facts about particulars; *N* is a true second order relation. The truth-maker of (3) is no longer the truth-maker of (2), the molecular state of affairs $Fa_1\&Ga_1..Fa_n\&Ga_n$, but a single relational state of affairs; the state of affairs which consists of *F* being related to *G* by *N*. When we evaluate (1), we are not altering the universal *F* just by considering the counterfactual assumption that *Fa*, and so we are not then bringing into doubt any of the true second order relations *F* holds with *G* in the actual world; particularly, we are not bringing into doubt that $N(F,G)$. There is a conventional element in the evaluation of counterfactuals that stipulates to keep fixed all the states of affairs which are not brought into doubt by the truth of the antecedent. It is in this way that we keep fixed $N(F,G)$. Now it is a thesis of (LRU) that (3) implies (2). Therefore, *a* is also *G* in the envisaged situation.[2]

This is the solution that Armstrong, with his version of (LRU), offers to the problem of how law-statements support counterfactuals. But now consider the principle

(D) If *A* affords good reasons to bring *B* into doubt and *C* implies *B*, then *A* affords good reasons to bring *C* into doubt.

The principle (D) is rational. The same reasons to bring *B* into doubt *are* reasons to bring *C* into doubt. If *r* is a reason to bring *B* into doubt, then *r* is a reason to think that *B* is false. But, as *C* implies *B*, *r* becomes a reason to think that *C* is false. Surely, anyone who thinks both that *B* is false by virtue of *r* and that *C* implies *B* cannot also think that *C* is true; being *r* the responsible for that. Well, perhaps he can still hold *C* in abeyance, so he is not obliged to hold it false. But that cannot be pressed too far. In fact, (D) relies on more basic principles like

(D*) If *A* implies *B*, then the degree of belief we can ascribe to *A* is less than or equal to the degree of belief we can ascribe to *B*.

Notice that it follows from (D*) that the believer cannot hold *C* in abeyance if he thinks that *B* is false.

As for (D*), it follows from the next theorem of probability theory, taking probability to be subjective probability, or degree of belief:

(D**) If *A* implies *B*, then $\text{Prob}(A) \leq \text{Prob}(B)$.

If this argument for (D) is correct, then Armstrong's thesis that law-statements support counterfactuals if laws are true relations between universals but not if they are merely regularities must be false and his argument to establish it must fail somehow. The reason is that, as we need to make explicit in the former justification, (3) implies (2), or, in other terms, the relational state of affairs *N(F,G)* involves that the extension of *F* is included in the extension of *G*. So if, as Armstrong thinks and it seems to be the case, the assumption that *Fa* brings into doubt the holding of the relation of extensional inclusion between *F* and *G* by modifying the extension that *F* has in the actual world, and since the sentence that expresses this relation is implied by the law-statement (3), then, by (D), *Fa* brings also (3) into doubt -by (D), we can say that *Fa* brings (3) into doubt as much as it brings (2) into doubt.

One possible way out not available to Armstrong could be to maintain that *N(F,G)* is a necessary fact, and argue that necessary facts are always kept fixed in new-thought situations in spite of there being reasons against their occurrence. It could also be pointed out that the problem we have just seen arose because Armstrong's theory of laws tried to preserve the

inference thesis; *i.e.*, the thesis which says that law-statements, however we construct the laws, must imply the corresponding regularity-statements. But the inference thesis seems clearly indisputable, even to the point of becoming a firm soundness criterion for theories of natural laws. It is my view, however, that there is still a third solution, which is consistent with both the inference and the contingent theses and hence is available to Armstrong. This solution consists of revising the supporting condition that has led to the problem. Let us then reject it and consider the next alternative condition:

(C) A law-statement supports a counterfactual if the truth-maker of the law-statement contributes to the truth of the counterfactual.

Condition (C) is satisfied by law-statements if their truth-maker is, as Armstrong suggests, a second order state of affairs, but it is not satisfied if the truth-maker of law-statements is, as the Humean believes, a molecular first-order state of affairs. The second order state of affairs $N(F,G)$ furnishes a respect of similarity that warrants the truth of the counterfactual.[3] Suppose (0) is true in the actual world. Then, the actual world includes a second order state of affairs, $N(F,G)$. Let w_1 be a world which differs from the actual world in the least number of possible respects compatible with the truth of Fa and of Ga. Let w_2 be a world which differs from the actual world in the least number of possible respects compatible with the truth of Fa and of $\sim Ga$. In evaluating the comparative similarity of w_1 and w_2 with the actual world, the respects of similarity generated by Fa in each occasion compensate one another, and then the final outcome depends on what Ga and $\sim Ga$ require in each case. But then it happens that, in w_2, the joint truth of Fa and of $\sim Ga$ imposes that $\sim N(F,G)$, so w_2 and the actual world differ in at least one law. On the other hand, in w_1, the truth of Ga just requires a dissimilarity on matters of particular fact between w_1 and the actual world. It is reasonable to claim that dissimilarities on matters of law are a more relevant respect of global dissimilarity than dissimilarities on matters of particular fact. So, finally, we obtain that w_1 is more similar to the actual world than w_2.[4]

Contrary to what the Humean believes, it does not seem that his typical truth-maker for regularity-statements does this service. The reason is that the truth-maker of a regularity-statement is now a first order molecular state of affairs which does not conflict with any new counterfactual state of affairs in the alternative possible worlds to consider. Then it does not make any difference between them as for their similarity to the actual world and, consequently, it will not contribute to the truth of the counterfactual. According to the

Humean, the actual world contains a complex state of affairs that makes (0) true, $Fa_1\&Ga_1...Fa_n\&Ga_n$. (Using the realist jargon, we can speak about the second order state of affairs $I(F,G)$, once it is understood that this state of affairs, which holds between two universals when the extension of the first is included in the extension of the second, and contrasting with what happened with $N(F,G)$, just consists of the mere composition of the first order states of affairs mentioned before.) Let w'_1 be a world which differs from the actual world in the least number of possible respects compatible with the truth of Fa and Ga. Let w'_2 be a world which differs from the actual world in the least number of possible respects compatible with the truth of Fa and $\sim Ga$. Now, however, w'_1 is not more similar to the actual world than w'_2 is: w'_1 involves one more violation in matters of particular fact than w'_2 does, while what makes the law-statement true in the actual world, the state of affairs $Fa_1\&Ga_1...Fa_n\&Ga_n$, remains unaltered in both worlds.

Notes

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1 Armstrong (1983, p. 50). Armstrong endorses the same view in more recent contexts; see Armstrong (1993, p. 145).

2 Armstrong's general method for evaluating counterfactuals can be described as follows. To evaluate a counterfactual like 'If P had been the case, then Q would have been the case', construct the thought situation S out of the actual one by adding the occurrence of P and keeping fixed all the actual states of affairs which are not brought into doubt by the occurrence of P, and then check if Q occurs in S.

Notice that there is no appeal here to any special modal traits of $N(F,G)$. It could have been argued instead that $N(F,G)$ is a necessary fact and that facts of this kind are always kept fixed in new-thought situations. However, this solution is banned to Armstrong because of his thesis that laws are contingent (see Armstrong 83, pp. 158 ff.).

3 For the sake of clarity I shall evaluate the relevant counterfactuals assuming that their truth conditions are those described by Lewis' theory (see Lewis 73). Nothing essential in the argument hinges on this assumption.

4 Notice that the different weight afforded by laws and particular facts relative to world similarity judgements can be ontologically explained in this account by the differences in type between second and first order state of affairs.

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