Having Your IBE and Eating it Too: Arguments for Inflationism about Natural Laws

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In *Philosophie der Technik*, Friedrich Dessauer writes that "the discovery of natural law is a meeting with God."[2] The importance of defining precisely what such laws are can hardly be overstated. They may be the key to understanding the very structure of reality. In this paper, I will explain the strengths of Dretske and Bird's arguments for inflationist theories of laws of nature. In particular, I will focus on those which Kreines refers to as "Brute Coincidence" and "Explanation" arguments. Central to the debate is the principle of inference to best explanation (IBE), which states that we have reason to believe the hypothesis that best explains a given body of evidence. Inflationism requires this IBE principle to defend the knowability of natural laws, leaving the theory vulnerable to an empiricist rejection of IBE. However, I will argue that deflationism implicitly assumes IBE in its own appeal to simplicity. Moreover, given IBE as a valid principle, inflationism is a stronger theory of natural laws, because it offers far greater explanatory depth with comparatively little cost to simplicity.

By "laws of nature," I'm referring to the laws pursued by the natural sciences. The contending views on what a law of nature is or, more modestly, what a law of nature *would* be, fall broadly into two categories: deflationism and inflationism.[3] In general, the strongest, most sophisticated form of deflationism is the Ramsey-Lewis "best-system" theory[4], which I address in this paper. It posits that laws of nature are nothing superseding those "universal truths" or observed natural regularities that are "appropriately axiomized."[5] According to Lewis, the appropriate axiomatization is to admit only the regularities that contribute the most to the "collective simplicity and strength" of the system.[6] By strength, Bird takes Lewis to mean "informativeness."[7] In this manner, the best systems theory is an iteration of the formula Dretske labels "law = universal truth + x," "x" being a principle about which regularities merit inclusion in the best system.

In contrast, inflationism argues that laws of nature *are* something over and above the mere regularities themselves. They are that which governs, or otherwise gives rise to the regularities we observe. One potential problem for inflationism concerns our knowledge of natural laws. If laws are something over and above the regularities themselves, and we can only observe the regularities, how can we have knowledge about said laws? Strict empiricism suggests we can not. If true, this is a significant disadvantage of

inflationist theories. Inflationism would leave science in a position of insurmountable ignorance. The laws themselves exist but they are beyond our grasp, wholly unobserved and therefore wholly unknowable. In contrast, deflationism would render laws knowable to science. If laws are just the regularities we observe, they are consistent with empirical knowledge that we can know about them. However, the inflationist might appeal to inference to best explanation to save knowledge of laws. By employing IBE, scientists can attain knowledge about the laws despite their epistemic inaccessibility. They are able to observe the regularities and infer their causes— the laws themselves.

Dretske offers a thought-experiment involving a coin toss intended to push our intuitions toward this interpretation of how science attains knowledge.[8] I will present a similar case involving a lottery. Imagine you regularly buy lottery tickets. Each month a new 5 digit winning number is announced, purportedly selected via a random generator. The chance of your number being drawn should be around 1 in 302,575,350.[9] After many months, you see a consistent pattern. The same combination of numbers wins over and over again. Perhaps you'd suspect some sort of foul play— that the random generator isn't really random at all. Most people would be suspicious that there's some reason explaining why this regularity has emerged. If you're sympathetic to this suspicion in the lottery case, you should be even more sympathetic to it in the case of natural laws. The

chance of matter in freefall accelerating at exactly 9.8m/s^2 in every single observable case by mere chance— without the law of gravity as a *governing* principle— is infinitely lower than the chance of a random generator churning out the same five digit number multiple times in a row.

In both cases, you would be implementing IBE, inferring from an observed regularity to an underlying explanation. The lottery case is analogous to inflationist constructions of how science functions. According to inflationists, scientists also employ IBE in order to gain knowledge of laws. They observe regularities in nature and use that evidence to devise hypotheses about laws that best explain it. In both cases, the lottery buyer and the scientist infer on the basis of observed regularities that there is something over and above them that gives rise to them.

Bird argues that deflationism fails to adequately explain regularities. He claims that "there are certain things we use laws for, in particular for explaining, that we cannot use regularities, however systemic."[10] He demonstrates this view with a thought experiment concerning a toaster. Suppose you have an electric toaster that keeps malfunctioning. You go to the store to inquire why this is happening. The employee tells you that every individual toaster of this model malfunctions in the same way. Would you be satisfied with this explanation? If he gives you a list of many other people whose toasters malfunction this way,

would that make it a better explanation of why your particular toaster is doing so? Consistent with empiricism, this explanation avoids the use of IBE, but it seems inadequate. Showing that the malfunction occurs universally across toasters of this type doesn't actually explain why this is the case. Bird explains that this form of explanation is circular:

> Being told that Emily's toaster does this and Ned's and Ian's too does not explain why my toaster does this. After all, if Emily wants to know why her toaster behaves this way, she is going to be told that Ned's does too and so does Ian's and so does mine...When we consider everyone asking why their toaster does this strange thing, we can see that the explanations we are being given are completely circular.[11]

If you find this explanation unsatisfying, you should find deflationism similarly unsatisfying as an explanation of instances of regularities. If deflationism is true, when scientists describe laws, they are behaving like the toaster salespeople—attempting to explain instances of regularities in nature with the regularity itself. This interpretation saves science from entanglement with IBE, satisfying empiricist concerns. However, Bird argues this type of explanation ultimately fails because something cannot explain itself.[12]

According to deflationism, matter in freefall accelerates at $9.8 m/s^2$ because matter in freefall accelerates at

9.8m/s^2. There is no additional governing principle such as a law of gravity to which we can appeal. F is so because F is so. Bird's toaster example illustrates the explanatory insufficiency of deflationist constructions of laws of nature. He argues that though "regularities are not explanations of their instances," we might mistake them for an explanation because their existence hints at one.[13] This aligns with our suspicion in the coin toss and lottery case that there is a reason for the regularities given our observation of the regularities. In both cases, we employ the IBE principle to devise an explanation for the observed phenomena. If IBE is your intuition in the lottery case and the toaster case, you would need to find a relevant disanalogy such that it isn't acceptable in the parallel case of scientists seeking knowledge about natural laws.

So, in part, inflationism's strength as a theory hinges on the acceptance of IBE. Inflationism requires IBE to salvage the knowability of laws; it is the means by which science can attain knowledge about laws to which we cannot have direct epistemic access. Dretske and Bird show that our ordinary intuitions implement IBE, so their opponents must find a disanalogy between parallel cases and that of natural laws to argue against IBE in the latter case. Secondly, they argue that deflationism fails to provide an explanation of instances of regularities because it violates the principle that something cannot explain itself.

Inflationism's dependence on IBE seemingly leaves the theory vulnerable to empiricist attacks, and that one can argue for deflationism by arguing IBE. However, I argue that deflationists are also under significant pressure to accept IBE. Though strict empiricism rejects IBE, deflationists seem to have no qualms about letting the principle slip into their deliberations. This principle states that given competing explanations of a body of facts we have reason to prefer that which best explains while requiring the fewest posits. Lewis himself explains his best-system view in words that ring of IBE. He explains that the regularities that "earn inclusion in the best system" are those that "have as much information content as [they] can have without sacrificing too much simplicity."[14]

Furthermore, one of the primary advantages of deflationism is its purported simplicity. Proponents claim that we have reason to prefer deflationism over inflationism because it invokes fewer metaphysical resources to explain the same body of facts.[15] It doesn't postulate anything over and above the regularities themselves to explain them. If deflationists wish to argue against inflationism on the basis of simplicity, they seem to require some version of IBE.

Next, I will argue that, given IBE, inflationism about natural laws is a better explanation of the relevant facts. Firstly, deflationism may need to appeal to more metaphysical resources than initially supposed.[16] Lewis identifies this

concern with regard to the best-system theory. Within the best-system, regularities are only laws if they contribute to the collective simplicity and strength of the system as a whole. But, according to Lewis, "different ways to express the same content, using different vocabulary, will differ in simplicity."[17] So, the simplicity of a given proposition is relative to the particular language used to express it. If so, the status of a law might change depending on the language it is expressed in. This seems like a detriment to deflationism as a universal metaphysical theory. To account for this, Lewis argues that the laws should "refer only to perfectly natural properties."[18] If so, deflationism needs to posit at least one metaphysical resource in addition to the regularities themselves— namely certain "natural properties to explain determinacy of interpretation."[19] Therefore, even if deflationism remains overall simpler than inflationism, the margin isn't so wide as it may ostensibly appear.

Regardless, simpler theories aren't stronger in virtue of simplicity alone.[20] Under IBE, the simpler theory is preferable only when all else is equal. Given IBE, Dretske and Bird's explanatory arguments take on increased significance. These arguments demonstrate that inflationism better explains the relevant facts, that is, the regularities we observe. Moreover, deflationism fails to offer *any* explanation of the same facts. Bird's toaster example highlights the circular nature of its attempt at explanation. You cannot explain an instance of a regularity by appealing to the regular-

ity itself. At best, this response merely hints at an explanation because it suggests that there is an underlying principle that provides reason for the instantiation. Dretske doesn't mince words on the subject: "the fact that *every* F is G fails to explain why *any* F is G...because the explanatory attempt is never even made."[21] On this view, deflationism seems to offer little to no value in terms of explanatory scope and depth. Since something cannot explain itself, and deflationism attempts to explain regularities merely in terms of the regularities themselves, it is an explanatory failure.
Even if we maintain that deflationism wins out for simplicity, its advantage here is only slight given Lewis's concerns about language. In contrast, inflationism's explanatory advantage is significant when one considers deflationism's utter inability to explain. Combined with IBE, Bird and Dreske's arguments about explanation become especially powerful. If the deflationists need IBE to argue on the basis of simplicity, and inflationism provides a better explanation of the relevant facts, it seems like they would be forced to accept inflationism.

Deflationists are seemingly left with a dilemma. If they reject IBE, they can mount an attack on inflationism on the basis of knowability. However, even if they are reluctant to admit it outright, they may need a principle like IBE to support why simplicity is relevant to determinations about a theory's philosophical advantages. And yet, the benefits of inflationism in terms of explanatory scope far outweigh the

cost to simplicity So, given IBE, inflationism seems like a stronger theory of natural laws. The deflationist must either renounce IBE, and forfeit the basis for one of their foremost advantages, or admit IBE and risk being forced to accept inflationism. In any case, they can't have it both ways; deflationists simply can't have their IBE and eat it too.

Notes

1. Thanks to Professor James Kreines for comments on earlier drafts of this paper.

2. Dessauer, Friedrich, Philosophie Der Technik. (Bonn: F. Cohen, 1927), 31.

3. Kreines, James, "Introduction and Cited Arguments Concerning Inflationary vs. Deflationary (aka "humean") Accounts of the Laws of Nature," 1.

4. Inflationists have argued that deflationism is false because if it posits that laws of nature are just regularities, it assumes all regularities are laws and this seems wrong. Best-System deflationism resolves this problem and is able to explain a sense in which regularities can be merely accidental, and not laws. (Kreines, 9)

5. Dretske, Fred. "Laws of nature." In Philosophy of Science, (1977): 253.

6. David Lewis, "New work for a theory of universals," in Australasian Journal of Philosophy, (1983): 367.

7. Alexander Bird, Philosophy of Science, (1998): 39.

8. Dretske 1977, 257.

9. "The New York Lottery," New York State Gaming Commission,

https://nylottery.ny.gov
10. Bird, 42.
11. Ibid., 46.
12. Ibid., 44.
13. Ibid., 46.
14. Lewis, 367.
15. Kreines, 3.
16. Ibid., 21.
17. Lewis, 367.
18. Ibid., 368.
19. Ibid., 371.
20. Kreines, 11.
21. Dretske, 262.

References

Bird, A. Philosophy of Science. Montreal: McGill-Queen's University Press, 1998.

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