

- Lewis, D. 1996. Elusive knowledge. *Australasian Journal of Philosophy* 74: 549–67.
- Stanley, J. 2005a. *Knowledge and Practical Interests*. Oxford: Oxford University Press.
- Stanley, J. 2005b. Fallibilism and concessive knowledge attributions. *Analysis* 65.2: 126–31.
- Weatherson, B. 2005. Can we do without pragmatic encroachment? *Philosophical Perspectives* 19: 417–43.

## *What fine-tuning's got to do with it: a reply to Weisberg*

ROGER WHITE

### 1. Introduction

It's hardly news that life exists and hence that the universe meets whatever conditions are required for life. What *is* news, physicists tell us, is that these conditions are extremely stringent. Given the physical laws, various constants must lie within very narrow ranges for a universe to be capable of sustaining life. In brief outline, the Fine-Tuning Argument (FTA) appeals to this datum in the following way. A life-sustaining universe is far more to be expected if it is the product of intelligent design than if it is not. So the fact that our universe is hospitable to life is evidence of design.

Both the premisses and the route to the conclusion of this argument can be challenged in a number of ways. But Jonathan Weisberg (2010) makes the striking claim that even granting generous assumptions, facts about the required fine-tuning of physical parameters for life can add *nothing* to the case for design. And hence 'the much touted fine-tuning of physics is irrelevant to debates about design' (431) I'll argue that Weisberg is mistaken.

### 2. Weisberg's critique

In order to focus on his specific critique, Weisberg grants for the sake of argument some crucial assumptions of the FTA. I'll do the same.

(A1) Given that the laws put very tight constraints on the conditions in which life can emerge, without the help of a designer it is highly improbable that a universe will contain life.

(A2) We should expect a designer to create a universe fit for living creatures.

Let the *Old Datum* be the fact that life exists and the *New Datum* that the universe is *fine-tuned* for life. The gist of Weisberg's critique is as follows. The FTA depends on a comparison of likelihoods. But the evidential relevance of the New Datum must be assessed conditional on what we already know. So the FTA requires the following premiss:

$$(1) P(N|D \& O) > P(N|\neg D \& O).$$

As Weisberg notes, the probabilities here cannot be understood as physical chances since we are concerned with the probabilities of the physical laws themselves. They are better understood as capturing degrees of evidential support putting rational constraints on one's credences. On this construal (1) amounts to the claim that given that there is life, the assumption that there is a designer gives us more reason to expect the universe to be *fine-tuned* for life than does the assumption that there is no designer. Weisberg argues that (1) is false on the basis of the following consideration.

(2) In creating a life-sustaining universe a designer has two options. (i) Create laws that require precise fine-tuning of constants to allow for life, (ii) create laws with less stringent conditions on life. (Either way the designer will ensure that the conditions are met). There is no reason to suppose that a designer would prefer the former.

Since (1) is false – i.e. given  $O$ ,  $D$  no more strongly predicts  $N$  than  $\neg D$  does – once we know the Old Datum, the New Datum has no further evidential relevance to the design hypothesis.

### 3. Reply to Weisberg

We ought to be suspicious that something has gone wrong here. Weisberg concedes that independently of considerations of fine-tuning, the existence of life may provide evidence of design. Presumably this is because of a difference in likelihoods: life is more to be expected given design than given no design. The new discovery that life requires very precise physical parameters can only increase this difference in likelihoods by showing life to be even less probable without design, and hence strengthening the FTA. But Weisberg's argument warrants closer consideration.

The New Datum as Weisberg defines it – that the universe is fine-tuned for life – can be understood as a conjunction of claims.

*Stringency (S)*: The laws put very stringent conditions on the existence of life.

*Hospitality (H)*: The universe is nevertheless hospitable to life.

Weisberg's critique appropriately focuses on  $S$ .  $H$  is not really a *new* datum as it just follows from  $O$ . Given this, (1) is equivalent to

$$(1^*) P(S|D \& O) > P(S|\neg D \& O).$$

It will make matters clearer to focus on (1\*). First note that the falsity of (1\*) cannot follow from (2) alone. (2) addresses only what a *designer* is likely to do. So at best it can be relevant to the left-hand side of this inequality. (2) might be thought to support

$$(3) P(S|D \& O) = P(\neg S|D \& O).$$

Or at least that we have no reason to assign  $P(S|D \& O)$  a particularly *high* value. It does not follow that  $P(S|\neg D \& O)$  is *at least as high*. Still, Weisberg's argument may go some way towards casting doubt on (1\*) as it might not be obvious upon inspection that  $P(S|\neg D \& O)$  is particularly low either. The key to seeing that  $P(S|\neg D \& O)$  is lower than  $P(S|D \& O)$  lies in noting that  $S$  and  $O$  are *negatively dependent* conditional on  $\neg D$ , but *independent* conditional on  $D$ . Put more carefully, (1\*) is a consequence of the following three premisses each of which should be granted given assumptions A1 and A2 above.

$$(4) P(O|S \& \neg D) < P(O|\neg S \& \neg D)$$

A1 says that  $P(O|S \& \neg D)$  is very low. Perhaps there are other obstacles to life's emergence even if no fine-tuning of constants is required. In this case  $P(O|\neg S \& \neg D)$  may be low also. But  $S$  adds a *further* constraint on life that can only make life less probable without the aid of a designer. So (4) should be uncontroversial granting A1.

$$(5) P(O|S \& D) = P(O|\neg S \& D)$$

A2 supports (5). We are supposing that a designer can be expected to create life by whatever means. It is no more or less probable that the designer will do so given that fine-tuning of constants is required.

$$(6) P(D|S) \geq P(D|\neg S)$$

On the way we are understanding these probabilities, (6) says that the fact that the laws put stringent conditions on life does not by itself provide any evidence *against* design. Whatever one's attitude to  $D$  and  $S$  may be, one ought not put *more* confidence in  $D$  conditional on  $\neg S$  than on  $S$ . I take it that this is plausible enough. Of course it is possible that a designer has a preference for laws that put stringent conditions on life's existence, or a preference for lax conditions. But as we have no reason to suspect so either way,  $S$  by itself has no bearing on  $D$ . At any rate, I suggest we grant this premiss for our purposes since Weisberg's specific critique in no way depends on denying it. (Indeed, that  $S$  and  $D$  are independent appears to be the

motivating thought behind Weisberg's critique. It is a mistake nevertheless to draw the conclusion that  $S$  and  $D$  are independent *conditional on*  $O$ .)

Now to show that (1\*) follows from (4)–(6).

$$(7) \quad \frac{P(O | S \& \neg D)}{P(O | S \& D)} < \frac{P(O | \neg S \& \neg D)}{P(O | \neg S \& D)} \quad (\text{from 4, 5})$$

$$(8) \quad \frac{P(D | S)}{P(D | S) + [1 - P(D | S)] \frac{P(O | S \& \neg D)}{P(O | S \& D)}} > \frac{P(D | \neg S)}{P(D | \neg S) + [1 - P(D | \neg S)] \frac{P(O | \neg S \& \neg D)}{P(O | \neg S \& D)}} \quad (\text{from 6, 7})$$

$$(9) \quad P(D | S \& O) > P(D | \neg S \& O) \quad (8, \text{Bayes' Theorem})$$

(9) is equivalent to (1\*). And in any event, (9) is just the conclusion of the FTA: given our prior knowledge that there is life, the new finding that only a very narrow range of physical constants will allow for life further supports the claim that the universe is the product of design. *Modulo* other objections to the FTA, 'the much touted fine-tuning of physics' certainly is relevant to debates about design.<sup>1</sup>

*Massachusetts Institute of Technology*  
77 Massachusetts Avenue, 32-d808  
Cambridge, MA 02139-4307, USA  
rog@MIT.edu

### Reference

Weisberg, J. 2010. A note on design: what's fine-tuning got to do with it? *Analysis* 70: 431–38.

1 Thanks to Dan Greco, Jonathan Weisberg and a referee for feedback.