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Appealing to Simplicity is Unfair

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ABSTRACT

What might be meant by saying that one theory is more 'simple' than another? Is the simpler theory always better? This article attempts to answer these questions and then to show that none of the a priori and empiricist justifications of simplicity are sufficient. Thus appealing to simplicity in philosophy, and even in science, seems to be unfair.
KEYWORDS: Simplicity, plenitude, a prior, empiricist.

1. INTRODUCTION

Most philosophers believe that the principle of simplicity is a theoretical virtue in science, as well as in philosophy. Sober says about this principle, "it has been described and defended as if it were a deletion rule, counseling agnosticism" (1981: 145). To explain simplicity, Ockham says that a hypothesis should not be asserted, or an entity postulated, if it is not needed to explain anything (1). In other words, other things being equal, the simpler theory is preferable.

Discussion of the principle of simplicity and its various justifications will be the first subject of this paper. Secondly, to address that appealing to simplicity in philosophy is more controversial than in science, I will examine the value of different justifications of simplicity.

The term simplicity can be interpreted in different ways. It seems to be used in various contexts and for different aims. Therefore, lack of an exact definition and the presenting of different kinds of this concept leads to some issues about it. The definition and various types of simplicity should be discussed in the initial stage of this paper.

The principle of simplicity is best known by Ockham's razor, although William of Ockham never used the term "Razor". He used the principle in many remarkable ways, and so in time it became associated with him. The term was, in fact, first used by William Rowan Hamilton in 1852. At one level, simplicity can be thought of as a principle of common sense. Huemer (2008) in his explanation gives this example. Suppose that you have a computer and a lamp on in your home and suddenly both of them shut off simultaneously. You can hypothesize that:

H1) There was a power failure

H2) The computer crashed and the light bulb burnt out

Both these hypotheses can account for the observed data, but (H1) is simpler due to postulating a single cause, while (H2) postulates two independent causes and is therefore less likely. Thus according to the principle of simplicity, it would be implausible to hypothesize H2 when H1 presents itself as a simpler option.

The principle of simplicity can be perceived from ancient times through medieval ages to the modern era. Throughout history, philosophers and scientists such as Aristotle, Aquinas, Galileo, Newton and Russell appealed to the principle of simplicity in various forms. Aristotle writes in his Posterior Analytics, "we may assume the superiority ceteris paribus of the demonstration which derives from fewer postulates or hypotheses" (2).

Aquinas believed that the world was maximally simple. He argues that "If a thing can be done adequately by means of one, it is superfluous to do it by means of several; for we observe that nature does not employ two instruments where one suffices" (2). This kind of opinion leads to the most popular formulation of simplicity: 'Don't multiply postulations beyond necessity'. Yet it is not clear whether 'postulations' refers to the hypotheses which are doing the postulating, or the entities being postulated, or both. Because of this problem it should be noted that there are two distinct senses of simplicity. Firstly, there is ideological or syntactic simplicity. According to this, a theory which takes fewer extra-logical terms as primitive and undefined is more acceptable than one which entails more, other things being equal. Secondly, we have ontological simplicity or 'parsimony' (Daly, 2010). This approach concerns the number of entities or kinds of entities which every theory postulates; that is, postulating fewer entities can be considered a crucial feature for a theory. It is a significant point that these four senses of simplicity are completely distinct. Ontological and Ideological simplicity typically 'pull in different directions'. A theory can be ontologically simpler when we make it ideologically more complex. For instance, the postulation of Neptune allowed scientists to explain the perturbation in the orbits of other planets without complicating the laws of celestial mechanics. Baker writes "there is typically a trade-off between ontology and ideology … in which contraction in one domain requires expansion in the other" (2011, 4). In addition to the above distinction, another distinction should be noted. This distinction is between qualitative and quantitative parsimony. Qualitative parsimony concerns the number of kinds (or types) of things postulated by a given theory, while quantitative parsimony concerns the

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number of individual things (or instances) postulated by the theory for each of the kinds (or types). For instance, the mind-brain identity theory (materialist theory) is more qualitatively parsimonious than dualism, because it is committed to only one type of entity while dualism is committed to two types of entity, that is, soul and body.

In this paper, I do not intend to discuss the different interpretations of Ockham's razor but the contemporary meaning of simplicity, which is regarded as the main meaning of it. Baker formulates the principle of simplicity in the following sentence: "Other things being equal, if T1 is more ontologically parsimonious than T2 then it is rational to prefer T1 to T2" (2011: 5).

Principle of Plenitude

It is not the case that all philosophers have accepted the simplicity principle. There are some thinkers who refuse to accept it or offer other approaches rather than this principle and sometimes even in conflict with it. This shows that the principle of simplicity is in dispute at least in some circles.

'The principle of explanatory sufficiency' appeared in medieval ages as a result of the discussions about Ockham's razor. For example, Walter of Chatton, a medieval thinker, suggests this principle: "If three things are not enough to verity an affirmative proposition about things, a fourth must be added, and so on" (2). This principle attempts to make a balance between simplicity and goodness of fit.

Furthermore, we have 'Principles of Plenitude' which are in conflict with the principle of simplicity. According to Leibniz, 'God created the best of all possible worlds with the greatest number of possible entities'. Generally speaking, if the existence of any object is possible, then that object must exist in the actual world. If we do not have any reasons to prove that unicorns exist and also do not have any reasons to reject their existence, then according to the principle of simplicity we should not postulate the existence of them. However, in this case a principle of plenitude suggests that we should postulate the existence of unicorns.

At this stage, it seems to me that when we do not have any reasons to postulate the existence of an object it is plausible that we do not postulate this object. To believe or postulate anything we always need to have some reasons. If, without any reasons, we add the existence of something to the world, we arbitrarily make the world complex. Therefore, in my opinion, the simplicity principle seems more worthy of further considerations than a principle of plenitude.

Justifications of simplicity

Since we have distinguished various types of simplicity, we can recognize which type of simplicity is being discussed in any cases we study. Now we should ask whether all types of simplicity, or only some of them, are significant features of scientific or philosophical theories. The principle of simplicity has been largely accepted in science, but its applications in philosophy are more controversial. We can see that some philosophers have appealed to simplicity in favour of their own opinions, but it should not be appealed to without any adequate reasons. Even if we have accepted that simplicity is a crucial feature for scientific theories, it is not sufficient to rely on an analogy with science or empirical reasoning to justify our use of this principle. Thus, different kinds of justifications should be examined to assess their values and see which of them can be applied in philosophy.

When simplicity is applied to philosophy, it is assumed that simplicity is an epistemic principle in this case, rather than a pragmatic virtue. Simplicity as an epistemic principle is formulated by Baker as: "If theory T1 is simpler than theory T2, then it is rational (other things, being equal) to believe T1 rather than T2 "(2). Thus, to justify this principle for its applications in philosophy, it should be asked why more simple theories tend to offer true beliefs rather than false beliefs. Most justifications in literature have focused on answering this epistemic question, and have attempted to offer an answer for all cases to which we can apply the principle of simplicity. There are various justifications of the principle of simplicity. Most of them can be categorized in two modes:

A) A priori justifications
B) Empiricist justifications

Mode A) presents the rationalist tradition in philosophy, and mode B) can be considered as an approach which follows the empiricist tradition. The next part of this paper will explore these two modes of justifications.

A) A priori justifications

This mode of justification is a rationalist approach that believes that we can come up with the under determination of theory by data if and only if we assume the a priori simplicity principle. Since in contemporary philosophy, analytical philosophy has developed and completed some aspects of empiricism, many philosophers tend to believe that a priori justification can only appear in metaphysics. However, theological justification and justification dependent on rationalist principles are two examples of non-metaphysical a priori justifications.

1) Theological justification

Some philosophers and scientists have tried to use their theological beliefs to prove some kinds of simplicity. Take, for example Leibniz's thesis that "God has created the best and most complete of all possible worlds, and his linking of this thesis to simplifying principles such as light always taking the (time-wise) shortest path" (2). We can see a similar approach embraced by scientists such as Kepler, Newton, Maxwell, Einstein and Hawking. However, today most scientists would not accept that religious beliefs direct methodological principles in science. I agree with this approach. Furthermore, it is my opinion that even if the religious beliefs we hold happen to be true, this does not necessarily make them useful grounds for methodological principles in science.

2) Metaphysical Justification

Some philosophers, such as Leibniz and David Lewis, attempt to justify the principle of simplicity by embedding this principle in a general metaphysical system. One of the best examples of this attitude is the possible world system of Lewis. However, he claims that only qualitative simplicity is used in his 'possible worlds' theory. Quantitative simplicity, one of the two types of parsimony (or ontological simplicity) is not theoretically significant in his view. Lewis writes in one of his earlier works:

I subscribe to the general view that qualitative parsimony is good in a philosophical or empirical hypothesis; but I recognize no presumption whatever in favor of quantitative parsimony. My realism about possible worlds is merely quantitatively, not qualitatively, unparsimonious. You believe in the actual world already. I ask you to believe in more things of that kind, not in things of some new kind. (1973: 87)

As we discussed earlier in this paper, qualitative and quantitative simplicity are distinct considerations, thus, it seems to me that it is plausible that one of them is considered as a crucial feature in a hypotheses selection, whereas another is not. However, it is obvious that the principle of simplicity has a significant role and theoretical virtue in Lewis's metaphysical system.

3) Justification dependent on Rationalist principles

Proving that the principle of simplicity originates in established rationalist principles is another rationalist attitude to justify simplicity. Baker writes:

Parsimony in a theory can be viewed as minimizing the number of 'new' kinds of entities and mechanisms which are postulated. This preference for old mechanisms may in turn be justified by a more general epistemological caution, or conservatism, which is characteristic of rational inquiry. (2011: 10)

Simplicity can be explained as an attitude which advocates minimization of the number of new mechanisms and entities and new types of entities which are postulated. This agrees with a more general epistemological caution or conservatism, which prefers old and less mechanisms and entities. Sober offers this justification as follows:

The razor is thus nothing more than a principle of induction which focuses on existence claims. In Quine's words, it embodies a taste for old mechanisms. When it comes to explaining a new phenomenon, existence claims which already have played an explanatory role are preferable over ones which lack such credentials, even when the new existence claim seems to be quite capable of explaining the novel phenomenon. (1981: 151)

So far, my paper has explored different approaches of a priori justifications of simplicity principles. In general, we can see a crucial problem with the a priori justification. In fact, it seems that these approaches are not justifications at all, because they only attempt to show how simplicity originates in other established principles of rationality. However, the question remains without adequate answers; in fact, rationalists only transfer the question to other principles postulated as primitive and ultimate principles. Furthermore, some philosophers, such as Goodman and Quine (1947) suggest that we can consider the theoretical virtue of parsimony as a self-evident proposition that depends on a philosophical intuition. However, it seems that according to this point of view, any discussions about justification are unnecessary. This approach appears to almost arbitrarily close any debate about the virtue of simplicity. In this way, Goodman and Quine's position seems probably unfair and unhelpful. Why not use this tack to establish any favoured position as self-evident and thus correct? The circularity of the approach is more than a little suspect.

B) Empiricist Justification

According to the empiricist perspective, science does not need any external philosophical or epistemic justification of simplicity principles. To justify simplicity, science needs only a general empirical argument as follows. Science, relying on the principle of simplicity, has been mostly successful at recognizing truths. It suggests that scientific method is truth-conducive. Therefore, because simplicity is a crucial element in the scientific methodology, simplicity is probably a true principle. In other words, if simplicity was not a true principle in scientific method, science would be less successful than it is.

This empirical argument seems to have some weaknesses. First, the argument presupposes that science has been highly successful at recognizing truths, but this presupposition is open to debate. Secondly, it is difficult to find out from actual scientific practices that simplicity was the crucial methodological element in them.

So far, I have attempted to show that none of the a priori and empiricist justifications of simplicity are sufficient. Thus appealing to simplicity in philosophy, and even in science, seems to be unfair. There is also another point which should be noted. It seems that in all cases in science, and especially in philosophy, when someone applies simplicity, the argument can be raised that other things are not equal. Because it is so difficult to prove equality of circumstances, this objection is a forceful one that deserves far more attention than I can now give to it.

REFERENCES

Boehner, P. (1957) Ockham: Philosophical Writing. Thomas Nelson and Sons.

Baker, Alan, "Simplicity", The Stanford Encyclopedia of Philosophy (Summer 2011 Edition), Edward N. Zalta (ed.), URL = <http://plato.stanford.edu/archives/sum2011/entries/simplicity/>.

Daly, C. (2010) An Introduction to Philosophical Method: Broadview Guides to Philosophy.

Goodman, n. & Quine, W. (1947) "Steps Towars a Reconstructive Nominalism," Journal of Symbolic Logic, 12, 105-122.

Huemer, M. (2008) "When is Parsimony a virtue?" The Editor of The Philosophical Quarterly, vol.50, 235, 216-236.

Lewis, D. (1973) Counterfactuals, Oxford: Basil Blackwell.

Sober, E. (1981) "The Principle of Parsimony," British Journal for the Philosophy of Science, 32, 145-156.