



Occam's Razor

Occam's razor is a principle first developed by the Franciscan friar and philosopher, William of Ockham.

Whilst it is likely that the philosophy was posthumously attributed to him, as it was based upon common medieval philosophy, it seems to be a result of his minimalist lifestyle.

Occam's razor is more commonly described as 'the simplest answer is most often correct,' although this is an oversimplification. The 'correct' interpretation is that entities should not be multiplied needlessly.

Researchers should avoid 'stacking' information to prove a theory if a simpler explanation fits the observations. Occam's razor is the process of paring down information to make finding the truth ^[1] easier.

In science, it is getting rid of all the assumptions that make no difference to the predictions of the hypothesis ^[2]. If you have a few hypotheses that could explain an observation, it is usually best to start with the simplest one.

Occam's razor ^[3] is not part of the reasoning process ^[4], as such, because it makes no definition of the relative strength of a theory. It is a 'heuristic maxim,' commonly known as a rule of thumb, guiding research down the easiest course.

In fact, the more complex hypothesis prediction may be the correct one.

Put it this way, if a research foundation is giving out money for research; is it going to go for the complex and expensive research program, or the cheaper and most likely explanation?

Science often works in a process of leaps, so even if the first option is proved wrong, the next one may achieve results.

One famous example of Occam's razor in action is found in conspiracy theories surrounding the NASA moon landings.

Many conspiracy theorists believe that the first Moon Landing was staged and filmed in a studio, part of an elaborate hoax. Their justification relies upon many twisted and convoluted theories, whereas the NASA argument is fairly straightforward.

The conspiracy line of reasoning contains too many suppositions: "If this happened, then this may have happened." Too many 'ifs' is a sign that a statement needs 'Occamizing' and clarifying.

Therefore, using Occam's razor, the NASA argument should be regarded as correct. This is

not the same as saying that it is proved, only that it is best to investigate the simplest theory first.

Occam's razor is often at the root of [paradigm shift](#) [5], where an established theory is replaced by a simpler alternative that also fits the data. For example, Ptolemy's epicycles were replaced by a simpler theory, which explained the data without multiplying elements.

There are some criticisms of Occam's razor. For example, it may not always be possible to determine which of a number of conflicting theories is correct, without the benefit of hindsight.

At the turn of the century, Einstein's supporters, and believers in ether, could not have known the simplest theory for the nature of light. Both hypotheses fitted the observed data, and only the Michelson-Morley experiment swung opinion towards Special Relativity.

In addition, it is difficult to pare away information without risk of throwing out something crucial to the theory. Occam's razor should be a guide and not a rule.

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[1] <https://explorable.com/truth-and-theory>, [2] <https://explorable.com/research-hypothesis>, [3] http://en.wikipedia.org/wiki/Occam%27s_razor, [4] <https://explorable.com/scientific-reasoning>, [5] <https://explorable.com/paradigm-shift>, [6] <https://explorable.com/users/martyn>, [7] <https://explorable.com/occams-razor>