

What do scientific experiments prove?

I have known people who put a lot of faith in scientific experiments. They reject arguments that contradict the results of these experiments, and, similarly, are wary of arguments, no matter how persuasive, that have not been “proven” by experiment. For such people, thought is flimsy compared to the cold, hard world of facts.

For better or for worse, I am not like these people. If somebody presents me with an exciting and plausible idea or theory, that suffices to intrigue me. If it intrigues me enough, and I see a way I might benefit from the theory, I will ponder it myself, closely and carefully. If I am sufficiently satisfied, I will apply it to my life.

And if somebody presents me with the results of an experiment, I will treat them in the same way. If they intrigue me, I will investigate them closely and carefully, and I may even make changes to my life as a result of them.

This similarity is a consequence of the fact that I take no position on the existence of universal truth. Without this concept, all we have are our perceptions, and a tool for organizing them: namely, our brains. Some of these perceptions are ‘external’ —like sights, sounds, and smells— , as they are induced by our outward-directed senses, and others are ‘internal’ —like thoughts— , as they are induced by our inward-directed senses. When we reason, we organize and build on these perceptions using the techniques of higher thought: that is, we generalize and abstract from those perceptions to form models for understanding them. But a model is no more and no less than a model: it is simply a way of understanding. Because models do not reflect anything “true” about the world, one need not feel forced to conform to them. On the contrary: the decision to adopt a model is a highly personal one, and depends on whether the perceived benefits outweigh the perceived costs.

Looked at in this way, theories and experiments are very similar. They are both based on external perceptions, and both result in models for understanding those perceptions. And when I said above that I would investigate a theory or experiment “closely and carefully” before deciding to let its consequences shape my life, that was the “highly personal” decision I mentioned in the previous paragraph.

Theories and experiments differ, however, in the degree to which they can be investigated closely and carefully: A good theory lays bare its assumptions and reasoning, which at least in principle should make it fairly easy to investigate by doing nothing more than pondering the ideas in question. On the other hand, a theory based on experiment is generally much harder to evaluate, reliant as it is on a great deal of external perception. In addition to the logical argumentation that accompanies any theory, one has to investigate the biases, measurements, methodologies, and statistics involved in interpreting the data. In my experience, it is quite difficult to be convinced that this interpretation is correct. What’s worse, the process is entirely secondhand: even if the report of the experiment is convincing, one has no idea of the accuracy of the information contained in it.

Ironically, while experiments appear on the surface to be more factual and hence more reliable than pure theories, they are actually less reliable, since their results are laden with

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so many contingencies. This is not to say that experimentation is a waste of time. As their name implies, experiments can be suggestive, and hence useful. But they are no substitute for great ideas.

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