

A comment posted to Sabine Hossenfelder's video "You don't have free will – but don't worry"

https://www.youtube.com/watch?v=zpU_e3jh_FY

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(With the addition of an answer to a comment)

Hi, Sabine and everybody,

Very interesting lecture: it has never happened that I disagreed so much with what was exposed.

1. Big Bang. This is one of the most preposterous theories in physics, taken as a dogma. Thinking physically, it is necessary to say what existed *before* the Big Bang. Furthermore, to circumvent the paradox that an enormous amount of matter was compressed, why didn't it form a super-hiper-duper black hole, physicists then come out with theories such as quantum vacuum and what not. The idea of the Big Bang is a discontinuity in space-time. This is a mathematical concept, and not a physical reality.

2. Free will cannot be proved or disproved, it has to be a personal experience. Here is one: think on two 3-digit numbers that mean absolutely nothing to you. Concentrate your thinking, imagine each one being displayed on a luminous display. Switch mentally between these imaginations. Now *choose* just one of them, and imagine for some seconds only its image on the display. You have just *decided* of what you were going to think next. There was absolutely no need to think on those numbers (they had no meaning for you), and on the one you chose to concentrate. These were your own decisions, out of your *free will*. Stating that this is an illusion does not conform with the experience. For you, this experience is absolutely real.

3. She talks about particles. But we don't know what they are. The electron is not a tiny ball and it does not revolve around the nucleus. Nobody knows what it is. Quantum mechanics uses formulas with terms which cannot be understood, as the spin of particles. Or instantaneous quantum jumps. Or non-locality (Einstein: "Spooky action at a distance."). Any experiment with an atomic particle changes its state: it is impossible to examine a particle in its original, natural state, so it is impossible to know what it is.

4. Physics uses formulas whose terms are measures done by instruments. Formulas are mathematical models, they are not the reality and they express approximately only what happens in those instruments. Her "scientific evidence" does not deal with reality, but with artificial experiments.

5. She says "Your brain is doing a calculation". But nobody can tell what the hell this calculation is. We don't know what thinking is, in terms of brain activity. We don't even know where the following representation of the number two, "2", is stored in the brain and how we use it. About this, see my bilingual essay

<https://www.ime.usp.br/~vwsetzer/conceito-cerebro.pdf>

I agree with her statement: “To make the best of your thinking apparatus, you need to understand how it works.” Unfortunately for her, nobody knows how our brain works. We know just some of its characteristics, all consequences and not causes.

6. She says “we are just running software” but nobody can show this software, much less the circuitry that interprets it (computers interpret software, they don’t execute it).

7. If one speaks about the software in the brain, it is necessary to show the code used and interpreted by the brain. We don’t know this code. My strong conjecture: it does not exist.

8. About determinism: astonishingly, she seems to ignore the Uncertainty Principle. Now take a living cell: my conjecture is that it is impossible to determine what it’s going to happen next, will it start subdividing, will it stay as it is, and will it start to die? It seems to me that there is a physical non-determinism in this change of states. Now take thousands, millions of cells in a tissue: which ones will change their state in the next instant? Also a huge physical non-determinism. My theory: the choice of which non-deterministic state transition to take next does not require energy, and thus can be influenced by “something” that is not physical: the model that regulates growth and tissue regeneration; that’s why, e.g., our hands and ears grow symmetrically. BTW: a neuron with the same inputs sometimes fires, other times doesn’t – another physical non-determinism.

9. And here we get to the main difference between Sabine and myself: she is a root materialist, and I am not. I admit, by hypothesis (not faith), that there are “substances”, and “members” in living beings, which are not physical. A Setzer’s “law”: “Materialist is someone who lives and works in a building which has no ground floor: s/he does not know what matter is.” Remember also the 85% of dark, unknown energy and 10% of dark, unknown matter, in the universe.

10. According to Sabine and others, we are determined by our internal states and the environment; but then we cannot be responsible for our acts. They are imposed on us. Einstein, being a Spinozist-determinist, said something like “I recognize that a criminal is not responsible for his acts. But this does not mean that I have to drink tea with him.” But when it became known about the Nazi extermination camps, he assigned responsibility to the whole of the German people. Typical scientist’s inconsistency.

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[The Lost One](#)

I’m having a hard time getting past your “preposterous theories” statement. What does theory mean to you? Please define.

My answer:

A mathematical theory is a set of axioms and theorems which can be proved from them. A physical theory is a set of abstract concepts or concepts derived from the physical world, and of causes and effects derived from them which apply to the physical world. A non-physical theory is a set of concepts using physical and non-physical elements. A non-physical theory should not contradict physical facts (but it may contradict judgements, interpretations of physical facts).

A good theory is one that is encompassing, explains physical or non-physical phenomena, has no contradictions, does not contradict known facts and has a special, subjective characteristic (which will be found strange by many people): it has to be sympathetic – because there is no complete theory which explains everything, even in restricted realms. I

give an example. The heliocentric model was accepted because of Newton's gravitational theory. It took almost 200 years for the discovery of a physical fact that proved it (Foucault's pendulum). Even without experimental proof, it was accepted because it was a good theory. BTW, it is a demonstration of the humankind's development of the capacity for abstraction.