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Can Physics Prove There Is No Free Will?

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9-11 minutes

Physicist Sabine Hossenfelder's recent essay, "How to live without free will," boggles the mind.

There are all manner of arguments against free will. All are wrong, of course, and most are poorly reasoned. But few are actually incoherent. Hossenfelder's essay is the exception. Here are some excerpts, with my commentary:

> It's not easy, getting a PhD in physics. Not only must you learn a lot, but some of what you learn will shake your sense of self.

For reasons that her account does not make clear, Hossenfelder thinks that her physics education provides her with insight into metaphysics and basic logic. Experience would suggest the opposite. Physicists have said some extraordinarily stupid things about philosophy; consider the late Stephen Hawking's claim that philosophy is dead.

> Physics deals with the most fundamental laws of nature, those from which everything else derives. These laws are, to our best current knowledge, differential equations. Given those equations and the configuration of a system at one particular time, you can calculate

> what happens at all other times.

No. The subatomic world exists in a state of potentiality, and is only actualized by observation (in the most widely accepted understanding of quantum mechanics). You can only calculate probabilities, not "what happens at all other times."

> That is for what the universe without quantum mechanics is concerned. Add quantum mechanics, and you introduce a random element into some events. Importantly, this randomness in quantum mechanics is irreducible. It is not due to lack of information. In quantum mechanics, some things that happen are just not determined, and nothing you or I or anyone can do will determine them.

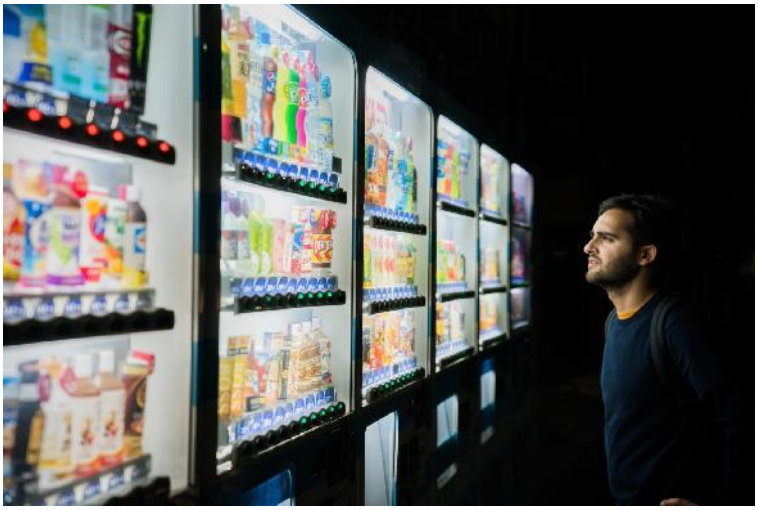
Hossenfelder seems to have learned about quantum mechanics between writing these two paragraphs. She contradicts herself. Yet she's wrong about quantum mechanics (QM). QM is not random. It is probabilistic, which is the antithesis of randomness. The probabilities can be calculated with remarkable precision.

She's right that determinism is false. That local determinism doesn't exist has been established clearly by experiments based on Bell's Inequality.

> I think I here spell out only the obvious, and use a notion of free will that most people would agree on. You have free will if your decisions select one of several possible futures. But there is no place for such a selection in the laws of nature that we know, laws that we have confirmed to high accuracy. Instead, whatever is about to happen was already determined at the big bang—up to those random flukes that come from quantum mechanics.

"But there is no place for [free will] in the laws of nature that we

know…" Then the laws of nature are incomplete, obviously. Why should Hossenfelder's grad school exams contain all truth about man? What astonishing stupidity and arrogance.



To go back, for a moment, to "a notion of free will that most people would agree on," the definition of free will is straightforward. Free will is the immaterial power of human beings to choose based on rational deliberation. It is different from appetites, which are materially-based desires that we share with animals.

Appetites and other material processes can surely influence free will (a bottle of whiskey will wreak havoc on your capacity for rational deliberation). But will is still free, in the sense that it is not *determined* by physical processes. Free will is an immaterial power of human thought and musings about equations and quantum mechanics are irrelevant to it.

> The most common form of denial that I encounter is to insist that reductionism must be wrong. But we have countless experiments that document humans are made of particles, and that these particles obey our equations. This means that also humans, as collections of those particles, obey these equations. If you try to make room for free will by claiming humans obey other equations (or maybe no equation at all), you are implicitly claiming that

> particle physics is wrong. And in this case, sorry, I cannot take you seriously.

Human beings are indeed made of “particles”, in one sense. But reductionism is still wrong. We are not merely aggregates of parts. There is a unity and essence that makes us human beings, and this essence transcends particles and “equations.” Human beings have immaterial (spiritual) souls.

> I have had this discussion many times. Many people find it hard to comprehend that I do not believe in free will. And any such debate will, inevitably, be accompanied by the joke that the outcome of the argument was determined already, haha, aren’t you so original.

Actually, her critics have a point. Why *does* she try to get people to change their minds if they aren’t free in some real sense to change their minds? It makes no sense to reason with someone whose will is wholly composed of “particles” and “equations”.

> I have come to the conclusion that a large fraction of people are cognitively unable to question the existence of free will, and there is no argument that can change their mind.

It’s hilarious. She misses the irony that she insists that people “change their minds” by accepting her assertion that they… can’t change their minds.

She provides her fellow men (that is, particles and equations) with four maxims:

> *1. You never had free will.*
>
> It’s not like your free will suddenly evaporated when you learned the Euler-Lagrange equations. Your brain still functions the same way as before. So keep on doing what you have been doing. To

> first approximation that will work fine: Free will is a stubbornly persistent illusion, just use it and don't worry about it being an illusion.

That's it. Just stubbornly choose to overlook the fact that you can't stubbornly choose. "Just keep on doing what you are doing…" It's noteworthy that the folks who deny free will always insist that we pretend we do have free will. In other words, we should pretend that free will deniers are fools. Heck, why just pretend?

> *2. Your story hasn't yet been told.*
>
> Free will or not, you have a place in history. Whether yours will be a happy story or a sad story, whether your research will ignite technological progress or remain a side-note in obscure journals, whether you will be remembered or forgotten – we don't yet know. Instead of thinking of yourself as selecting a possible future, try to understand your role, and remain curious about what's to come.

Just lay back and enjoy your equations, all you clumps of particles. What Hossenfelder surely means, of course, is "Don't take me seriously." Okay.

> *3. Input matters.*
>
> You are here to gather information, process it, and come to decisions that may, or may not result in actions. Your actions, and the information you share, will then affect the decisions and actions of others. These decisions are determined by the structure of your brain and the information you obtain. Rather than despairing over the impossibility of changing either, decide to be more careful which information you seek out, analyze, and pass on. Instead of thinking about influencing the future, ask yourself what you have learned, eg, from reading this. You may not have free will, but you still make

> decisions. You cannot not make decisions. You may as well be smart about it.

Gibberish. If you have no free will, you can't "make decisions." Equations and particles make no decisions. Nor do they pretend.

> *4. Understand yourself.*
>
> No one presently knows exactly what consciousness is or what it is good for, but we know that parts of it are self-monitoring, attentional focus, and planning ahead. A lot of the processes in your brain are not conscious, presumably because that would be computationally inefficient. Unconscious processes, however, can affect your conscious decisions. If you want to make good decisions, you must understand not only the relevance of input, but also how your own brain works. Instead of thinking that your efforts are futile, identify your goals and the strategies you have for working towards them. You are monitoring the monitor, if you wish.

"Processes in your brain… computationally inefficient… how your brain works… monitoring the monitor…"? Nonsensical jargon. Think of the irony: she entreats us "If you want to make good decisions…" after insisting that we can make no decisions at all, let along good ones.

She slaps us on the back and says, in effect, you really are just particles and equations, but can pretend that you aren't, even though I've argued that you can't choose to pretend anything. Don't take my irrational nihilistic nonsense too seriously.

I fear for her students and for naive people reading her blog. Her credentials as a physicist will lead some of them to take her word-salad seriously. It is a commentary on the degraded state of our public discourse that ideas like this are taken seriously in many

quarters, and aren't just grist for comedy routines and psychiatric conferences.

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