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Article

Determinism as *the cause* of free will

O determinismo como causa do livre-arbítrio

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ABSTRACT

This paper aims to demonstrate that the only way for freewill to exist is through a deterministic Universe, which is governed by physical and biological laws which cause events, namely free will. We will first analyze determinism, indeterminism and compatibilism, highlighting their main ideas through key authors. Afterwards, we will demonstrate that determinism is the only ontological philosophy that can allow the existence of events, namely desire, will and volition – i.e. free will.

Keywords: free will, volition, determinism, indeterminism, compatibilism.

RESUMO

Este artigo pretende demonstrar que a única forma de existência do livre-arbítrio é em um universo determinístico, governado por leis físicas e biológicas que causam eventos, incluindo o próprio livre-arbítrio. Primeiramente, analisaremos o determinismo, o indeterminismo e o compatibilismo, destacando as principais ideias dessas três correntes filosóficas por meio de alguns de seus principais autores. Em seguida, demonstraremos que o determinismo é a única filosofia ontológica capaz de permitir a existência de eventos como desejo, vontade e volição – ou seja, do próprio livre-arbítrio.

Palavras-chaves: livre-arbítrio, volição, determinismo, indeterminismo, compatibilismo.

1 Introduction

Freewill (or volition[1]) is one of the oldest philosophical problems. For several centuries, a wide range of authors have studied the topic without, however, reaching any kind of consensus. From a canonical perspective, we can say that the agent is free if his\her actions are *not determined* by antecedent events nor by the laws of Nature \ Universe[2], (indeterminism or libertarianism). In contrast, the agent is not free if his\her actions are *determined* by antecedent events and by the laws of nature (determinism). However, there are philosophers who argue that free will is compatible with determinism (compatibilism).

In this article we will initially expose the essential ideas of determinism, indeterminism and compatibilism. Subsequently, we will suggest and demonstrate that the only way for volition to exist is through determinism, not strictly through a compatibilist theory but under the scope of a canonically hard deterministic perspective.

2 Determinism

Although there are numerous explanations of determinism (Earman, 1986; Pereboom, 2007), we can start with a very simple one, postulated by the Nobel Prize in Physics in 1999, Gerard´T Hooft, which we will use throughout this paper, which is the following: determinism is the theory that "all physical processes are completely controlled by laws" (2016, p. 5). We can also consider determinism as the idea that: "the position that every event or action, including human action, is the inevitable result of preceding events and actions and the laws of nature." (Caruso, 2012, [s.p.]); or that "every event is necessitated by antecedent event conditions with the laws of nature" (Hoefer, 2024, [s.p.]).

Determinism is therefore, in few words, the ontological theory that argues that all events are determined by antecedent causes and by naturalistic laws (Honderich, 1988; Sapolsky, 2023; Hoof't, 2016; Hossenfelder e Palmer, 2020; Sapolsky, 2023; Spinoza, 2005). In fact, I think we could define determinism as the theory that claims that everything that exists or happens is *caused* by physical laws (or by Nature \ Universe). Determinism is not, therefore, as some might define it, "the philosophy that all events can be predicted accurately" (Kaku, 2021, p. 69). Prediction and measurement are scientific tools with epistemological, not ontological, purposes (Romeijn, 2022). Determinism, in contrast, is an ontological theory (Honderich, 1988; Hooft, 2016 Hossenfelder e Palmer, 2020) – which addresses how the Universe and its laws determine (or cause) events (Spinoza, 2005), not necessarily how we are aware or how we can know, or measure, those causes (Sapolsky, 2023; Bombarda, 1902). We can postulate determinism according to the following proposition 1:

1) The Universe and everything that exists in it exists because there are laws;

2) The laws of the Universe cause events;

3) Therefore, everything that exists in the Universe exists because there are laws that cause events.

Determinism claims that 1) for an event to exist (X) it must have been caused; and 2) when an event (X) is caused by another event (E1), the first event (X) could not have happened differently for the simple reason that the event that caused it (E1) happened in a certain way (Pereboom, 2007). For the determinist philosophy, everything that exists must have been caused by antecedent events and by the laws of Nature. So, determinists believe that every event in the Universe, namely, all atoms, force fields and all matter-energy in the Universe, our thoughts, desires and behaviors, our ideas, motivations and decisions are caused by previous events (Double, 1991; Honderich, 1988; Hoof`t, 2017). Regarding

[1] We will use freewill and volition indiscriminately.
[2] we will use Universe and Nature indiscriminately.

human decisions, wishes and phenomenological experience (namely free will), these are caused by the functioning of neurons that are activated by external and internal stimuli (Sapolsky, 2023; Wegner, 2002; Libet, 1999; Dennett, 2003; Eagleman, 2005, 2008; 2012). Now, if our thoughts and desires are caused by the functioning of our neurons, then when I think of a red rouse or when I have a desire to eat an ice cream, these ideas and desires (event X) could not be others because what caused those thoughts and desires was that neuronal network and that context (E1), and not another. If the neuronal network, as well as the context, were different (E2), then the thoughts and desires would be different and not those I had (X). Moreover, if E1 (a certain neuronal network and a certain context) causes X (the desire to ice cream) then X happens whenever E1 happens. Note, however, that this causation between X and E1 is not epistemic. It is not based on logic, semantics or in a symbolic understanding, supported by mathematics that tries to predict probabilities. The causality between E1 and X is ontological, with or without epistemological or teleological possibilities. For this reason, X can also be caused by E2, under other circumstances. That is, E1 causes X in context 1 but E2 can also cause X in context 2, as well E3 in context 3, and so on. What matters for determinism is *that events (x) are caused by previous natural events (E1, E2, E3…)*. I can, for example, be watching television and, suddenly, the television turns off due to a power outage (event X). This power cut could be caused by a lightning strike (event E1) that hit the power source, causing an electrical discharge. But the power cut (event X) can also be caused by a short circuit in the power system (event E2). Both lightning (E1) and a short circuit (E2) can cause X. In this sense, there can be multiple causes for X and not only one (Honderich, 1988).

In this sense, according to deterministes, we can only choose one of two statements: either all events are caused by the laws of Nature - the same is to say they are deterministic - or there are *uncaused* events, which are events that bypass and violate the laws of Nature. However, determinism argues, if they violate the laws of Nature, they cannot exist in Nature \ Universe (Double, 1991; Pereboom, 2007; Serrado, 2024). To think that the Universe has laws and that, from time to time, it can violate them is to affirm that the Universe can give up the laws that allow its existence and functioning, which does not make any sense. In the same way, if an event is not caused it is *uncaused* and, if it is *uncaused*, how can it exist? Let's imagine a door that opens. Either something *caused* the door to open, or the door opened without anything causing it. If nothing caused the door to open, how did it open? We can hardly defend that the door was opened by some *uncaused* event. If this is true for a door, why shouldn't it also be true for *all phenomena* in a physical Universe? Why shouldn't it be true for our thoughts, desires and behaviors? Some will say that the door (or other objects) does not have phenomenological experience, and because of that it can't have volition. But isn't it possible - and probable - that this phenomenological experience is, also, caused by physic laws, as determinism claims. Can phenomenology exist while evading the laws of physics? In other words, can consciousness exist without being caused and without being subsidiary to the laws of Nature? How does a conscious thought – or any other mental event – come into existence without being caused? Moreover, how can something within a system that is governed by natural laws can exist violating the laws that allowed its existence? We consider that, due to the need for everything that exists to have been caused, all events must be caused by previous events and by the laws of Nature. To think otherwise would be to think that *acausal* events existed by magic, but even so, magic would be the cause of these events, so they would no longer be *acausal* and magic would be totally compatible with the laws of Nature (Slattery, 2014).

3 Indeterminism

If determinism is the theory that defends that all events in the Nature \ Universe, like human behavior, must be caused \ determined by antecedent events and the laws of nature, indeterminism (or libertarianism) is the theory according to which some events, namely free human decisions, are *not* determined by

any precursor cause, nor by the laws of Nature (Balaguer, 2014; Kane, 2005; Ginet, 2008; Chishom, 2003; O`Connor, 2000; McCann, 1998). We can see indeterminism according to the following proposition:

1) free will is incompatible with determinism,

2) we have free will,

3) therefore, determinism is false.

Simple indeterminism is the theory that the person can initiate their actions without being determined by the past or by the laws of nature (Ginet, 2008; McCann, 1998). According to simple indeterminism, a *mental event* such as a reason, a desire, or an intention can cause a decision and initiate an action, but nothing causes that mental event. In the understanding of philosopher Carl Ginet, any human action is, or begins, with a simple mental event – a reason - that was not caused by any previous event (2008).

The philosopher Hugh McCann, in the same line as Ginet, considers that the agent is free when the action is a *spontaneous* event and is intrinsically intentional. Intention, according to McCann, does not cause an action but *is* the action. This deliberate action does not require any prior causality but, on the contrary, the action, being intentional, causes events. In this sense, actions are not causal, but teleological since they have an propose, an objective (1998, p. 128).

Agent-causal indeterminism can be considered a version of simple indeterminism. For centuries, the idea that the soul allowed human volition was common (Descartes, 2008). More recently, in a period in which, in the philosophical-scientific context, the defense of the existence of a soul that controls the body became less valid, several philosophers sought to find justification for human freedom through a distinct property in the human being, namely a non-physical phenomenological consciousness. In this way, it wouldn't be in the soul that we could find the explanation for human freedom, but in a special feature of the human being – his immaterial consciousness (O'Connor, 2000; Chishom, 2003).

In the opinion of philosopher Timothy O'Connor, the human beings possesses certain special properties, namely an immaterial consciousness, distinct from matter, that allows *uncaused* volition but which, however, causes events in the physical world. According to O`Connor, consciousness emerges from physical processes, however, it is a fundamental property, distinct from physics, which gives autonomy to the agent. In other words, O`Connor advocates that the phenomenology and the physical are two fundamental properties of the Universe and, as two distinct fundamental properties, they can interact with each other. Thus, consciousness is a fundamental property that arises through a physical structure (the brain) but because it is emergent and non-physical, it exists above that structure, as an immaterial phenomenological property (O`Connor, 2000).

The philosopher Roderick Chishom, in the same way as O`Connor, argues that consciousness (the self), as emerging property from the brain, can act on the brain itself, that is, it can intervene in the neuronal process, in loop. From this perspective, the agent – his\her phenomenological experience - can control the brain, thus causing actions. According to Chishom, we can consider that the human being moves his hand and that the hand was activated by certain muscles and the nervous system, however, we must consider that some of the neuronal events "were caused by the agent and not by other events" (2003, p. 31). The self, according to Chishom, therefore has the powers to intervene in his own brain because the self is not his brain – is the phenomenological entity that emerges from the brain, the self, that is free and cannot be reduced neither to the brains or physics. In this way, actions *are not* caused by the persons 's desires or beliefs because the self can act against these beliefs and desires to achieve a greater and a noblest action. In Chishom's understanding, a person may have a (hurtful) desire *caused* by the brain, but the self can *cause* a different decision, intervening in the decision-making process, reaching a better outcome (Chishom, 2003).

Causal indeterminism differentiates itself from other types of indeterminism by seeking to find an understanding for freewill within the laws of physics, bypassing the difficulty of other indeterminisms in explaining how *acausal* events exists. According to causal indeterminism (Kane, 2005; Balaguer, 2014; Mele, 2000) the Universe works in a random way, since the pillars of the Universe – quantum physics – are

indeterministic. That is, causal indeterminism is based on quantum indeterminism to explain freewill. This quantum indeterminism, in turn, is based on two principles (much discussed and debatable, to say the least): 1) that quantum indeterminism can be verified at the level of neuronal systems; 2) and that quantum indeterminism is *uncaused* (Kane, 2005; Balaguer, 2014). Therefore, causal indeterminism postulates that, especially when human beings have to make more complex decisions (torn decisions), quantum indeterminism, which these libertarians will adapt to neuronal functioning, plays a central role.

The philosopher Robert Kane argues that it is possible that quantum leaps can be observed at the neuronal level, which could explain the neuronal indeterminism that the philosopher postulates. In Kane's words, if the functioning of the brain is indeterministic, then "the result of this chaos can amplify quantum indeterminism in the firing of individual neurons" (2005, p. 134). According to this point of view, quantum behaviors govern the activation of neurons, meaning that the last are subordinated to randomness, chance and luck that govern the quantum world. What confers freedom, in the understanding of causal indeterminists, is the agent ability to freely *choose* which of the stochastic thoughts, memories, feelings, desires and wills he\she wants to act on. In other words, according to causal indeterminism, the agent has the freedom to decide which of the countless thoughts and multiple (possible) decisions his\her quantum mind generated (Kane, 2005).

The philosopher Alfred Mele has a similar thought, postulating that when a person has to make a complex decision, he\she is free to make the best decision because his mind has a set of beliefs, desires and intentions that *choose* the ideas and thoughts that arise in the mind in an indeterministic way. For Mele, the introspective ability of human beings to choose the best solution that their mind formulates, gives volition to that person (Mele, 2000).

4 Compatibilism

In addition to determinism and indeterminism, there is another philosophy that deals with freewill: compatibilism. Compatibilist philosophers (Fisher, 2007; Dennett, 2003; Hobart, 1934; Locke, 2008; Schopenhauer, 2005) accept that we live in a deterministic world but consider that, even so, ontological determinism is compatible with the existence of freewill. As many philosophers consider that freewill is necessary for moral responsibility to exist, we can look at compatibilism as the philosophy that tries to reconcile these two aspects (McKenna and Coates, 2024).

The philosopher R.E. Hobart[3] argues that not only is freewill consistent with determinism, but freewill is only possible in a deterministic world, that is, freewill requires determinism. According to Hobart, indeterminism is confusing because if, as indeterminism claims, my actions are *determined* by my desires, beliefs or my character, then *determinism* is true. In this philosopher's understanding, either actions are *determined* by the agent or they are not. If they are determined by the agent, as libertarians argues, then indeterminism is false and determinism is true. For Hobart, saying that actions come from the self "is to say that they are determined by the self" (1934, p. 3). If they are indeterminate, then actions have no cause, that is, they are not caused by anything or anyone, meaning freewill cannot exist.

For Hobart, there is a causal relationship in indeterminism theories that proves determinism since, as indeterminism claims, an agent's action needs to be *determined* by something, and if it has to be *determined* by something, it is because *determinism* is true. That is, if there is a causal relationship between the agent, namely her\his character and her\his action (as defended, especially by simple indeterminism), this causal relationship must be deterministic. Therefore, either the character *determines* the action, or the character does not determine action (Schopenhauer as an analogous idea (2005)). In

[3] Dickinson S. Miller´s pseudonym, student of William James.

the same sense, either character is *determined* to cause actions, or it is indetermined to cause actions since the actions of the self, if not determined, would become random, disordered and incoherent. Or the agent´s character *determined* (or cause) good or bad actions, and the agent is free to determine his\her actions and can be responsible for them, or the agent´s character does not determine anything and volition cannot exist and the agent cannot have any responsibility for his\her (random and incoherent) actions. If character is not determined (if it is not determined to be good or bad), then, in Hobart's words: "what you have is not a morally admirable or condemnable, not a morally characterizable self at all." (1934, p. 3). In some way, if the agent can perform X, that is, if he\she has the *power* to perform action X, it is because there are laws that *determine* him\her to do X. Thus, if there are laws that allow the agent to do X is because certain laws allowed that action, which is only possible in a deterministic Universe (Hobart, 1934).

Daniel Dennett, in the same sense, argues that determinism is compatible with freewill because it is determinism, in fact, that provides us the ability to avoid dangers, make choices for a better future and have self-control. Freewill, according to Dennett, depends on a healthy brain, governed by physical and biological laws that can, in fact, grant freedom to the agent, and not make him depend on compulsions or lack of self-control – problems that result from brains with some kind of mental syndrome, chemical unbalance or neuronal injuries. In other words, this philosopher postulates that any human being with a healthy brain has moral responsibility because it is precisely his\her healthy neuronal neurobiology that confers moral responsibility. Moral responsibility is thus caused by the brain, as well has volition (2003).

On the other hand, Dennett considers that the ability of certain beings to avoid the future is a clear demonstration of freewill, particularly in humans, who have the ability to anticipate the future better than all other species, namely death itself, which can, sometimes, be prevented. Evolution developed organisms with nervous systems, which allow them to represent environment and subsequently anticipate the future. The different nervous systems designed by evolution allowed several species to adapt better to the environment in which they were located, namely avoiding future dangers. These species capable of avoiding events Dennett calls them *avoiders*. In this sense, according to Denett: "A toy model of determinism demonstrates that in the Vast space of possible configurations of "matter" there are some that persist better than others, because they have been designed to avoid harm" (p. 62). Of all avoiders, humans are the most capable. In Dennett's words: "We are virtuous avoiders, preventers, interferers, forestallers today. We have managed to get ourselves into the happy situation of having enough free time to sit around systematically looking into the future and asking ourselves what to do next" (2003, p. 54). Determinism does not, therefore, imply inevitability since millions of living beings avoid dangers all the time.

5 Determinism as a cause of freewill

We have seen that libertarians philosophers reject the idea that human beings can be free if they are subordinated to the laws of physics and to the antecedent causes that restricts their volition (Ginet, 2008; McCann, 1988; O'Connor, 2000; Chishom, 2003; Kane, 2005; Balaguer, 2014); and that compatibilists argue that, despite determinism being true, human beings do have freedom (Hobart, 1934; Dennett, 2003).

Now, we would like to challenge the indeterminists' position and deepen the compatibilists' position through a new proposal that, although similar to Hobart's, has arguments that seem innovative. Our proposal involves a question that arises from the proposition 1 mentioned above. We assume that, in a Universe ruled by laws as ours, can only occur events caused by laws. Suggesting the opposite, as indeterminists claims, would be inconsistent, since it is impossible to exist *uncaused* events in a Universe where laws must cause all the events that exists (Serrado, 2024). Thus, if there are only events caused

by laws, and if freewill exists, then *freewill has to be caused*. So, the question with which we begin our proposal is: what if it is only possible for freewill to exist in a deterministic Universe? What if determinism is the only way that allows individual volition? What if freewill is more than compatible with determinism and is, instead, subservient to determinism? This is what we will propose.

We saw that the proposition of indeterminist philosophers in relation to free will is something like this:

1) the Universe is deterministic;

2) we have freewill;

3) therefore, determinism is false, which is why it is indeterminism that allows freewill;

or like this:

1) quantum physics is indeterministic;

2) we have freewill;

3) therefore, determinism is false, so indeterminism is what makes freewill possible.

But I think the conclusion is hasty. It is hasty from the outset because indeterminists start from the premise that we have freewill, which is, from the outset, debatable. We could say that:

1) the Universe is deterministic;

2) we have freewill;

3) therefore, we cannot have freewill.

But the indeterminist conclusion is hasty, above all, because they conclude that the only way for freewill to exist is if the Universe is not deterministic and is, subsequently, indeterministic. In fact, indeterminists precipitate to conclude that determinism makes freewill unfeasible because they consider that: 1) the agent must be the cause of free action, without any interference from past events or the laws of Nature (simple indeterminism and agent-causal indeterminism); 2) or the agent must be able to control indeterminism, even if this violates the laws of Nature (causal indeterminism). In a nutshell, indeterminists have a central idea: *human beings can only be free if they violate the laws of Nature*, that is, if the event designated freewill (an action or decision) is not caused by any event nor by the laws of Nature. Robert Kane, for example, postulates that indeterminism has a condition: "the agent should be able to act and act otherwise (choose different possible futures), given the same past circumstances and laws of nature" (2005, p. 38). Balaguer defends the same when saying that libertarianism requires human decisions to be "undetermined – i.e., not causally determined by prior events" (2019, p. 3). McCann, in the same sense, tells us that indeterminism is a philosophical proposal that postulates that: "…decision and action are, at least usually, exempt from nomic causation, and that if these were not so we would not be free or responsible" (1998, p. 8). Carl Ginet, in roughly the same vein, states that: "…a choice that is up to the agent at the time it occurs cannot be caused, even indeterministically" (2014, p. 24).

Now, these ideas present three central problems, which I identified and analyzed elsewhere (Serrado, 2024): 1) causal indeterminism assumes that freewill can only exist in an random Universe, which is illogical, since random could not provide stability nor coherence in decisions, character and behavior; 2) indeterminism assumes that freewill is based on *acausality* of the freewill, which is equally illogical, since there cannot be uncaused events; 3) agent-indeterminism assumes that a non-physical phenomenological (or dualistic or *uncaused*) self, interacts with the physical world, namely the brain, which is equally illogical because, not only because we cannot see how a non-physical propriety can interact with a physical propriety, but also because we cannot see how the self can violate de laws of Nature.

5.1 Freewill as a physical cause

We argue that the Universe in which we live has laws that, more than *being* only laws according to which the Universe works, are laws that *are* the *very foundations of the Universe*; they are laws that allow the existence of the Universe and, at the same time, are the Universe itself (Spinoza, 2005; Davies,

2019; Hooft, 2016; Krauss, 2013; Hawking and Mlodinov, 2012). For that reason, it is *impossible* for the Universe to abdicate these laws because, in doing so, the Universe would risk its own existence, which is a paradox (Serrado, 2024; Spinoza, 2005). Now, in a Universe like ours, which exists because there are laws that allow and support its existence, there can be nothing, no single event, that could be not caused; that is, it is not possible for uncaused events to exist. If X exists, it is because it was brought into existence by a cause Y – that is, by some law of the Universe. In other words, if X exist is because the Universe *caused* it. The opposite would be to suggest that there are uncaused events (Ginet, 2008; McCan, 1988; Kane, 2005; Chishom, 2003). What is a uncaused event? It is an event that had no cause, but how can there be uncaused events in a Universe whose foundations are laws that cause events? How can exist uncaused events in a Universe that was, itself, caused by the Big Bang (Krauss, 2013; Hawking and Mlodinov, 2012)? How can there be events that are not caused by the laws of the Universe? We could, in fact, argue that an uncaused event is an event that cannot exist because, if it was not caused, it cannot exist. It seems like a logical and simple conclusion to us. However, this statement becomes even stronger when applied to a Universe that is governed by laws, that exists because there are laws that causes events; and that exists inherently to those laws (Serrado, 2024). In this sense, how can volition exist in our Universe without having been caused? How can an ontologically indeterministic system guarantee *uncaused* freewill? How does a system that is indeterministic – that *uncauses* events!! – can provide the event freewill? It doesn't seem possible. Let's take a look at the indeterminist proposal.

1) the universe is ontologically indeterministic;

2) something to exist must be caused;

3) the indeterministic universe cannot cause any events due to its *acausal* nature,

4) therefore, not only can an ontologically indeterministic Universe not cause something, but freewill cannot exist if it is not caused by something.

We suggest that freewill, if it exists in the Universe with laws, had to be caused, so it has to be the result of a deterministic Universe. Neuroscientist Anil Seth states that we cannot have volition in relation to the laws of physics and the Universe (Seth, 2021) but we suggest that only the laws of physics can give us volition. This idea stems from a statement by neuroscientist Gerald Edelman that seems fundamental to us: "Freewill – whatever you thing about it, we're determined to have it" (in Seth, 2021, p. 201). In the same sense as Edelman, we argue that we are *determined* to have freewill because our Universe *caused* it. Spinoza has a similar idea, arguing that everything is determined but the agent can become free (can self-determined) through a better knowledge and a better understanding of their *caused* innate nature (2005).

The Universe, through its laws, caused quarks, neutrons, atoms, molecules, cells, nervous systems, consciousness and people. We might think that, in some way, there are huge differences between all these physical, biological and phenomenological properties, however, they were all caused by laws and, subsequently, are themselves laws in the sense that they belong to the *physicality* of the Universe - we could say that they are modes of Nature / Substance[4] (Spinoza, 2005). Therefore, we propose the following proposition (2):

1) the Universe causes events;

2) if the Universe causes events it is because it is deterministic;

3) freewill exists;

4) if the Universe causes events it is because it is deterministic, so if free will exists it had to be caused

5) therefore, determinism caused freewill.

Another question that we can address is the following: in the same way that volition cannot exist

[4] Spinoza used substance to refer to Nature - and everything that existed, exists and would exist, a concept related to the way the Universe is understood in contemporary times (2005).

if it is indeterministically *(un)caused*, how can indeterminism guarantee the necessary stability for free-will to exist? If indeterminism is a theory that argues that events have no cause and do not depend on the laws of Nature; which postulates that randomness and probabilities govern the Universe, how can chance - instability - guarantee constancy to the Universe, not only in order to life flourish, but also human behavior and volition?

Human actions, to be free, must be caused by the agent but must also be stable and coherent (Sapolsky, 2023). Only in this way can we say that a person has good or bad character; only then can we say that a person has good or bad values; only then can we say whether a person has an ethical sense or not; and only then can we say whether a person is responsible for their actions or not (Hobart, 1934). If a person performs actions indeterministically – randomly - how those actions could be free and how those actions could be determined by a stable and coherent character? As Sapolsky postulates: "Even if quantum indeterminacy reached behavior [and there is no evidence that it does], we have the fatal problem that the only thing that would be produced would be randomness" (2023, p. 243) - which is precisely the opposite of the consistency that we all want our character and our actions to have.

At the end of the 19th century, psychiatrist and philosopher, the portuguese Miguel Bombarda observed this problem in a very sharp way. Determinism would be, in Bombarda's view, crucial for the balance and stability of the Universe since this determinism was nothing more than the harmony of the laws that made the Universe functionate in a perfect way. Without these laws, that is, without the determination of a set of deterministic fundamental principles, the Universe could not have equilibrium and, subsequently, life. Miguel Bombarda questions what it would be like if the Universe were no longer governed by deterministic laws: "The same body would be transparent at this moment only to be opaque in a few moments, these and those vibrations would now manifest themselves as electricity and then offer themselves under the form of heat or magnetism…" (Bombarda, 1902, p. 13). It would be chaos and life, possibly the Universe, would be impossible to exist as we know it. The same would happen in the brain and, subsequently, with human behavior. Let us imagine the human being subject to indeterministic "laws"[5] according to Bombarda:

> *"The same individual would indifferently do evil and good, would now behave in one way and then behave in an entirely different way… All this would be done independently of mental organization, independently of education. and any other reasons for determination" (Bombarda, 1902, p. 20).*

We absolutely agree with Bombarda. Without laws, that is, in an ontologically indeterministic Universe, it would be impossible to have stability, consistency and cohesion of events, particularly with regard to human behavior, which, being random, would be completely unpredictable, unstable and contradictory, entirely incompatible with freewill. It would be impossible the existence of live and intelligence in a such instable and anarchically system but we can imagine how an agent would seem like. As everything else in that Universe, the agent would be, as Bombarda postulate more the 100 years ago, a vehicle of disorder, randomness and unpredictability, wanting now one thing only to want its opposite after a few seconds; deciding now to go to the right only to decide to go left, before deciding go back after few seconds; believing at one moment he wanted to help a poor man who was being robbed, only to believe that that it was better to leave him and go to the meeting that was more important, before wanting to steal a car and go to the beach. In an ontologically indeterministic world, governed by *acausal* laws[6] that (un)caused events in an ontologically random way, events would occur *acausally* in a such chaotic, disordered and unorganized that would be impossible any kind of freewill. Indeterminism

[5] We argue that Indeterministic laws are an illogical concept in the sense that only a deterministic system can cause laws, but we will use the expression to be able to imagine a system where randomness reigns.
[6] Even foreseeing the (im)possibility of there being acausal laws

would affect all events in the Universe, namely our brains, which would be frequently invaded by indeterministic, random and *acasual* events (Bombarda, 1902; Serrado, 2024).

In contrast, an ontologically deterministic Universe, unlike an ontologically indeterministic one, allows the evolution of that same Universe through stable laws that, through stability, allow change and evolution, as we can see in the physical, chemical and biological processes that created the Universe we inhabit (Krauss, 2013; Hawkings and Mlodinov, 2012). The physical particles created in the Big Bang are not rigid or inflexible. Quite the opposite. The plasticity and flexibility of the physical particles created in the Big Bang enabled the creation of new physical forms, which subsequently resulted in chemical, biological and phenomenological processes (Damásio, 2010; Ledoux, 2019). Moreover, biological life, namely the nervous system, is the result of a Universe working for billions of years, in accordance with physical laws that allow flexible stability so that, occasionally (at least once (?)), life could emerge and flourish. If, in a deterministic Universe, composed of laws, life does not thrive (Krauss, 2013) – at least the Universe near us – we can imagine what the possibilities of life would be like in an indeterministic Universe, governed by disorder, chaos and instability. Perhaps these Universes can exist, however, I have no way of imagining a Universe that could exist without laws and without causes. I can imagine a Universe with laws and causes incompatible with life; with disordered laws that do not allow the necessary order and stability for the emergence of life; but a Universe without laws and without causes (as indeterminism suggests) is, simply, a Universe that cannot exist, precisely because it has no laws or causes below which things could bear to exist and evolve – to have been caused and therefore to exist.

5.2 Freewill as a biological cause

We saw that only in a Universe that causes events through physical laws – such as quarks, neutrons, atoms, cells, animals, brains and consciousness – can freewill exist. From a canonical point of view, freewill is seen by determinists by the agent´s lack of power to avoid antecedent events and to violate the laws of nature in all his\her decisions (Earman, 1986; Honderich, 1988: Pereboom, 2007; Double, 1991; Spinoza, 2005); is seen by indeterminists as the agent´s power to carry out actions without them being caused by antecedent events or the laws of Nature (Kane, 2005; Ginet, 2008; Chishom , 2003; Balaguer, 2014); and is seen by compatibilists as the agent's ability to carry out actions that can determine their will (Hobart, 1934; Locke, 2008; Schopenhauer, 2005), plan decisions and anticipate the future (Dennett, 2003). We agree with determinists when they argue that it is impossible to have volition bypassing the laws of Nature and antecedent events and we agree with compatibilists, especially with Hobart's, when he argues that freewill depends on determinism. We do *not* agree with indeterminism because we argue that: 1) there cannot be *acausal* events; 2) human beings are part of Nature, so they cannot violate its laws[7] (Serrado, 2024).

However, despite agreeing with determinists – and ostensibly assuming ourselves as hard determinists – we want to suggest a different perspective on freewill. We can see volition, not just around the idea of the agent being free if he\she manages to violate the laws of Nature – which seems illogical to us –, but as something that exists as a phenomenological experience, in the form of a feeling. In other words, we can think of freewill as a feeling and question whether, in the form of a feeling, volition could exist?

It seems obvious that the phenomenological experience of volition exists and must have been caused. If human beings *feel* that they are free - that they have *freewill* - then perhaps freewill is nothing more than a feeling, as many authors argue (Wegner, 2002; Seth, 2021; Gazzaniga, 2011; Haggard, 2005, 2008; Jeanerod, 2006; Soon et al., 2008; Bode et al. 2011 e 2014; Fried at al. 2008).

This feeling of freewill is what gives power (using an expression used by John Locke (2008)) to the agent to prefer or choose something. Thus, freewill is *not* the ability to violate the laws of Nature neither

[7] I probe into indeterminism misconceptions elsewhere (Serrado, 2024).

the power to suppress antecedent events. Freewill is the one´s capacity to choose from at least two alternatives. And to do that, the agent must always *feel* that he\she is free to choose. If the agent is choosing with the feeling that he is free, that means that the agent is having volition. In contrast, if the agent is choosing without the feeling of volition, then we don't have any doubts that the agent is not having volition. In other words, *the felling of freewill is a necessary condition to have freewill*. Remove the feeling of freewill and volition fades way. So, we postulate that freewill is nothing more than a conscience *feeling of volition* (Jeanerod, 2006; Wegner, 2002).

Many would hasty to say that, then, if it is just a feeling, freewill does not exist – the agent is not free. We refute it saying that, if the feeling of freewill exists – if the choice of the agent is being made by the volition of the agent (even though the feeling of volition is caused by agent´s brain) – than free will exist. Not the libertarian free will but a deterministic freewill than can only existed in a deterministic Universe. If the only thing that can give the agent the feeling that he\she is free – since that without the feeling of free will the agent is clearly not free - then, the agent is free only because he\she has the capacity to have the *feeling of volition*, nothing more and nothing less. The agent has not the power to *cause* the feeling of freewill or other feeling whatsoever. As Schopenhauer postulated, the agent has not the power to desire what he\she desires or not do desire what he\she does not desire (Schopenhauer, 2005). Volition happens to the agent. The agent does not have the freedom to cause volition but, in contrast, volition can give the agent the feeling of freedom – the capacity to choose what he\she wants, even though what she\she wants cannot be caused by the agent.

The idea that freewill is the power to violate human nature and to suppress antecedent evets; or the idea that the agent can control his\her brain is only an idea – an illogical idea. It exists only as an idea, like many other illogical ideas. In contrast, the feeling of freewill is much more than an idea. It is a real feeling that guarantees the existence of volition itself because the *feeling of volition* and *volition* are exactly the same thing. In other words, thinking about freewill as the agent's ability to violate the laws of Nature, namely the functioning of one's brain, is an impossibility – a paradox – which is why we would suggest that the problem should revolve around what really matters, what we know exists and can, in fact, confer volition on the agent: the *feeling of freewill*.

Therefore, 1) if we live in a universe governed by laws, 2) all events are caused by laws, 3) therefore feelings are caused by laws. As many authors have demonstrated, feelings are neurophysiological processes that arise due to certain neuronal systems specialized in creating the wide range of feelings that we can have, such as the brain stem, the thalamus, the amygdala, the insula, the cingulate cortex, supplementary motor area and the orbifrontal cortex, among others (Damásio, 2000, 2010, 2023; Ledoux, 2019; Jeanerod, 2006). When a person has the feeling of hunger or thirst, joy or fear, desire or motivation some of those areas are active according to specific neuronal maps (Damásio, 2000; Ramachandran and Hirstein, 1997; Ledoux, 2019). Some studies have demonstrated, for example, that when the agent has the volition to perform an action, his\her action is performed in accordance with that volition. However, as nothing in the Universe can be uncaused, many studies show that volition is caused by the brain, namely by the supplementary motor area (Libet, 1999; Haggard, 2005, 2008; Bode et. al 2011 and 2014; Fried, 2008), the cingulate cortex (Soon et al., 2008) or the cortex left hemisphere (Gazzaniga, 2011), among others. It may be a simple action – such, for example, as raising a wrist – but when this happens, some neural systems are activated *before* the feeling of volition. In other words, the agent acts because some brain areas cause the feeling of volition and, subsequently, the decision to act. It is very well documented the existence of persons who can act and develop a set of extremely coordinated actions *without the feeling* that they are the ones who are performing those actions, which is extremely disturbing for these people. Without the feeling of volition when performing certain actions, these persons are not free to perform those same actions (Wegner, 2002; Eagleman, 2012). As we have been highlighting, without the *feeling* of volition we would not have any freewill.

Daniel Wegner (2002) was one of the first authors to suggest that freewill is a feeling. For him, the agent initiates the actions through subconscious systems that *cause* the *feeling of volition* and it is this feeling that

creates the *illusion* of freewill. Note that, when Wegner say that the feeling of freewill is an illusion is not arguing that the feeling does not exist. He is saying that, the feeling of volition, is not what one could think – that one is totally free to act, even disobeying to the laws of nature or violating the brain´s determinacies.

We argue that is this illusion that may confuse – even deceive - many libertarians. Their answers are responding to an illusion – the powerful illusion that our volition is the source of our freedom, even if this violate the laws of Nature. Incapable of understanding that the freewill they feel is only a feeling – a very powerful feeling that can lead us to believe in powers and we do not have but yet, only a feeling; convinced that they have the power to violate the laws of nature, libertarians insist in ideas without the minimum philosophical logical and scientific prove. They seem to ignore that (as Spinoza suggested over 400 years ago and Jeanerod recalled more recently) it certainly appears that we are the causes of our actions but, in fact, we ignore the causes from which our actions originate (Spinoza, 2005; Jeanerod, 2006).

As with all other feelings, one thing is the phenomenology of the event, the experience of freewill, and quite another is the *computed* [8]event. Both are physics events but, the first is (neuronal) phenomenological ant the latter is (neuronal) computational[9] - i.e. not conscious. Both the phenomenology and the *computational* are, however, caused - as we said, both are neuronal events. In Wegner's words: "the experience of will is a mere feeling that occurs to the person. It is to action what the experience of pain is to the modifications that result from the stimulation of pain, or as the experience of emotion is to the bodily modifications associated with that emotion" (2002, p. 13). In the same way as the feeling of volition, the feeling of pain (the phenomenology) is not the same as a sprained foot (the computed network), nor is the *feeling* of fear (the phenomenology) the same as the norepinephrine release (the computed network), nor is the *feeling* of desire (phenomenology) the same as dopamine release (the computed network). However, all of these *neuronal* computations cause *neuronal* phenomenology (Damásio, 2000; Ramachandran and Hirstein, 1997). Thus, the experience of volition is a consequence of a certain neuronal functioning (some computations), just like the experience of another feeling (of pain or fear). In few words, some brains structures, when fire in some way and with specific patterns, can *cause* a wide range of feelings, among them the feeling of freewill \ volition.

That is why Seth considers that freewill is, like consciousness, a controlled hallucinatory perception (2021) – like a feeling, consciousness is also a perception. In this view, volition exists, as does consciousness (in fact, freewill exist only as a conscious experience), but they are caused by the brain and are, strictly speaking, perceptions (Seth, 2021; Metzinger, 2009). According to Seth, in the same way that red is a perception of something that does not exist as our perception suggests, freewill also exists as a perception that is not what we think it is. Red is a perception, in the same way that freewill is a perception. However, there is an ontological reality associated with red, in the same way that there is an ontological reality associated with freewill – as well with pain, hunger and fear (the neuronal computations as we suggested). What we mean is that, both red and volition – as well as other feeling \ perceptions - are caused by what exists in the real world, they're not what we think (what we perceive) they are. We can, in fact, to say that red and freewill (or fear or hunger), as they are perceptions, are phenomenological concepts for a more complex ontological reality (Kant, 2008). In other words, red and freewill exist in the real world, but they exist as perceptions – as phenomenological constructs or as *controlled hallucinations* -, since the ontological reality inherent to these perceptions is distinct from the perception itself[10] (Seth, 2021; Ramachandran and Hirstein, 1997). This is another of the libertarians' problems: treating freewill according to an epistemology mindset – as how we perceive it - preferring to ignore its ontology, that is, what causes freewill.

[8] Computational in the sense that is the cause of the phenomenological.
[9] We purposely did not distinguish phenomenology from the physical, which many authors tend to do. For us, phenomenology can be phenomenological and physical.
[10] The philosopher Thomas Metzinger has an idea similar to this, considering that consciousness is a model of self that phenomenally replicates the brain, creating a virtual owner who is nothing more than a model or an illusion (2009).

Daniel Dennett has an idea similar to ours when he postulates that freewill is a property (an ability) created by evolution that, over time, has improved, particularly in human beings. For him, volition was caused by evolution, which created nervous systems capable of having will, which is an idea that we corroborate. For the philosopher, we are free from the moment our brain allows (or cause) us to be responsible of our actions and carry out our decisions with moral sense, through self-control. Therefore, the agent wants his\her decisions to be determined by his\her reasons, intentions and character (which are deterministically caused) and not to be indeterminate, because this would mean that the person would be dominated by randomness and unpredictability, which is the opposite of what It is desirable for every human being. As physicist Paul Davies says: "To get free will we don't really want indeterminism: we want our will to determine our actions" (Davies, 2019, p. 202). In other words, the agent wants his actions to be determined by his feelings (desires, volition, character), and not by indeterministic factors that come from nowhere (Hobart, 1934). As we already said, freewill implies stability and coherence, which only deterministic events can provide (Sapolsky, 2023). We all know how dramatic life can be with a person with a dual personality, or with personality disorders, who manifest a clear lack of stability - a stability that is still much lower than what would be within an indeterministic universe – and subsequently lack of freewill. That is why we do not want our decisions and actions to be unlike as those our feelings and character can cause (as indeterminism claims), but rather to be those that can be determined by our identity and our personality, even if these feelings, decisions, this identity, character and this personality are determined by the laws of physics and by the biology of our brain – something that most people are most likely not even aware of. In a nutshell, as Dennett, Hobart, Davies, Spinoza and Edelman suggest, we argue that human beings are determined to have freewill.

Freewill is, in this sense, a feeling \ perception. Nothing more, nothing less, but an extremely important feeling \ perception to maintain the agent's identity. In other words, the agent is free because he\she can voluntarily express his\her will, even if he\she does not control that will (Schopenhauer, 2005). In other words, the human being is free but does not control his freewill, simply because his\her volition was imposed on him\her (Davies, 2019; Locke, 2008) – it was caused by the laws of physics and by biologic evolution of human nervous system (Dennett, 2003). The agent can, therefore, do whatever he wants - as long as his\her brain has the capacity to cause the feeling of volition - even if he\she cannot stop desire what he desires because he does not have the freedom to stop desire what his brain caused in the first place in the form of desire (Schopenhauer, 2005). That is, desire being caused by the brain does not allow the agent to stop desiring what he\she desired. Even if, as indeterminists suggest (simple indeterminism and agent-causal indeterminism), the agent acts on this will (Ginet, 2008; McCann, 1998; Chishom, 2003; O'Connor, 2000) this action (this supposed freedom that goes against an initial desire) is also caused by the brain in the form of another desire – the desire to go against the initial desire (Wegner, 2002).

Of course, indeterminists would object this claiming that the agent can only be free if nothing causes their decision, that is, if the agent decides freely without any constraints and free from any laws of nature. But this is a mistake taking into account our propositions1 and 2 (see above). There is nothing that invalidates the fact that freewill cannot be caused. In fact, thinking that freewill can exist as an *uncaused* event is illogical. In this sense, we suggest a review of what freewill is because the libertarian freewill - the idea that there can be *uncaused* events that *cause events*, such as the freewill - is not only a dead end, but also a logical impossibility (Serrado, 2024).

In short, freewill exists because it was caused by the brain in the form of feeling \ perception. Of course, the brain was caused by biology, namely, by a genome, which was caused by the crossing of two genomes, which were caused by antecedent events, in a process that goes from here until the birth of the Universe (Hooft, 2016). Our future was written in the Big Bang (Krauss, 2013; Hawking and Mlodinov, 2013) but this does not invalidate freewill because, in fact, freewill exist as a caused event. Thus, not only can volition exist as a caused event – which only determinism makes possible – but it can only exist if a nervous system has the capacity to *cause* the feeling \ perception of freewill. In this sense, freewill is not the ability of human

beings to avoid preceding events and to violate the laws of Nature, as indeterminists propose (Ginet, 2008; McCann, 1998; Kane, 2005; Balaguer, 2014); it is not the ability of a non-physical phenomenological property to interact with a physical brain (O`Connor, 2000; Chishom, 2003). Volition is a *feeling caused* by the brain (Weger, 2002; Gazzaniga, 2011; Libet, 1999; Hagard, 2005; Jeanerod, 2006; Soon et al. 2008; Gazzaniga, 2011; Bode et al. 2011 and 2014; Fried, 2008), similar to other feelings such as hunger, thirst, fear and joy (Damásio, 2000, 2010). In this sense, we agree with Edelman when he says that the human being is determined to have volition, but also with Dennett when he says that the only thing that gives the agent volition is his\her healthy brain and, fundamentally, we agree with Hobart, for whom there can be *no* freewill without determinism. Determinism enables freedom - in fact, determinism is *the* cause of freewill.

6 Conclusion

We saw that determinism is the philosophy that argues that freewill is not possible because the agent is subordinate to the events preceding the action and the laws of Nature; that indeterminism, in contrast, is the philosophy that claims that human beings are free because their actions do not depend on antecedent events or the laws of Nature; and that compatibilism is the theory that argues that determinism and freewill can co-exist.

Then, we suggest that the only way for freewill to exist is through determinism. We claim that freewill can only exist if it is 1) caused by the physical laws of the Universe and if it is 2) caused by the brain´s biology in the form of a feeling of freewill (or volition). We therefore suggest a new definition of freewill, different from the canonical one, as it appears groundless – a dead end.

1) We advocate that the Universe we inhabit is a physical system, governed by physical laws, whose existence depends on these physical laws. These physical laws cause events, namely everything that may exist in this Universe, so it is not possible for uncaused events to exist, as argued by indeterminism. Uncaused events are an impossibility because any event in this Universe must be caused to be brought into existence; and because if the Universe is governed by laws that cause events, then it is not possible for events to exist that violate these laws. Therefore, if freewill exists, it is because it was caused, not uncaused. In the same sense, if freewill was caused by physical laws, this means that freewill can only exist in a causal deterministic Universe.

2)We also argue that freewill (or volition) is a feeling \ perception caused by the brain´s biology. In this sense, volition exists because there are neural systems that *cause* the feeling \ perception of freewill. Thus, it is through the agent's ability to feel volition that he\she feels that is free. In fact, if an agent does not feel freewill, he\she can´t be free. *The feeling \ perception of freewill is, therefore, a necessary condition for freewill to exist*. In few words, it is the experience of the feeling of freewill caused by the brain which allows the existence of free will.

Finally, it is important to mention that we do not consider our proposal to be framed within the compatibilist philosophy. We confess that it may be tempting to relate our ideas to a proposal to make determinism *compatible* with free will, however, what we suggest is not a compatibility but a relationship of cause and effect. Determinism is, in our view, an ontological law of the Universe that causes effects, namely free will. That's why we are hard determinists all the way.

References

BALAGUER, M. 2014. *Free Will*. Cambridge: MIT Press.

BODE, S.; BODE, P.; SOON, C. S. 2014. Demystifying "free will": the role of contextual information and evidence accumulation for predictive brain activity. *Neuroscience & Biobehavioral Reviews*, **47**: p. 636-645. Doi: 10.1016/j.neubiorev.2014.10.017.

BODE, S.; HE, A. H.; SOON, S. C.; TRAMPEL, R.; TURNER, R.; HAYNES, J.-D. 2011 Tracking the Unconscious Generation of Free Decisions Using Ultra-High Field fMRI, *PLoS ONE*, **6**(6): e21612. doi: 10.1371/journal.pone.0021612

BOMBARDA, M. 1902. *A consciência e o livre arbítrio*. Lisboa: Livraria de

António Maria Pereira.

CARUSO, G. 2012. *Free Will and Consciousness*. A determinist Accont of the Illusion of Free Will. Lexington Books: New York.

CHISHOLM, R., M. 2003. Human Freedom and the Self. in WATSON, G., ed.,2nd ed., *Free Will. Oxford*: Oxford University Press.

DAMÁSIO, A. 2010. *Self Comes to Mind*: Constructing the Conscious Brain. New York: Pantheon.

DAMÁSIO, A.; et al. 2000. Subcortical and cortical brain activity during the feeling of self-generated emotions, *Nature America*, **3**(10).

DAMÁSIO, A, 2023. Feelings Are the Source of Consciousness. *Neural Computation*, **35**: p. 277-286.

DAVIES, P. 2019. *The Demon in the Machine. How hidden webs of information are solving the mystery of live*. New York: Penguin.

DENNETT, D. 2003. *Freedom Evolves*. London: Penguin Books.

DESCARTES, R. 1637\2008. *Discurso do Método*. As Paixões da Alma (tradução, prefácio e notas de Newton de Macedo). Lisboa: Sá da Costa Editora.

DOUBLE, R. 1991. Determinism and The Experience of Freedom, *Pacific Philosophical Quarterly*, **72**.

EAGLEMAN, D. 2012. *Incognito*. The Secret Lives of the Brain. London: Vintage.

EARMAN, J. 1986. *A Primer on Determinism*. Dordrecht: Reidel Publishing Company.

EDELMAN, G. 1995. *Bright Air, Brilliant Fire*. New York: Harper Collins.

FISHER, J. M. 2007. *Compatibilism*, Four Views on Free Will (eds. FISCHER, J. M.; KANE, R.; PEREBOOM, D.; VARGAS, M.) Oxford: Blackwell Publishing.

GAZZANIGA, M. 2011. *Who´s in charge*. Free Will and the science of the Brain. New York: HarperCollins Publishers.

GINET, C. 2008. In Defense of a Non-Causal Account of Reasons Explanations, *J Ethics*, **12**: p. 229-237 DOI 10.1007/s10892-008-9033-z.

HAGGARD, P. 2005. Conscious intention and motor cognition. *Trends in Cognitive Sciences*, **9**(6): p. 290-295. https://doi.org/10.1016/j.tics.2005.04.012.

HAGGARD, P. 2008. Human volition: Towards a neuroscience of will. *Nature Reviews Neuroscience*, **9**(12): p. 934-946. https://doi.org/10.1038/nrn2497

HAWKING, S.; MLODINOV, L. 2012. *The Grand Design*. New York: Bantam.

HOBART, R. E. 1934. Free Will as Involving Determination and Inconceivable Without It, *Mind*, **43**(169): p. 1-27.

HOEFER, C. 2023. Causal Determinism, *The Stanford Encyclopedia of Philosophy*, Edward N. Zalta & Uri Nodelman (eds.), URL = <https://plato.stanford.edu/archives/spr2023/entries/determinism-causal/>.

HONDERICH, T. 1988. *Mind and the Brain*. A Theory of Determinism. Oxford: Clarendon Press.

HOOF`T, G. 2016. *The Cellular Automaton Interpretation of Quantum Mechanics*, New York: Springer.

HOSSENFELDER, S.; PALMER, T. 2020. Rethink Superdeterminism, *Front. Phys*. **8**: p. 139. doi: 10.3389/fphy.2020.00139

JEANNEROD, M. 2006. Consciousness of Action as an Embodied Consciousness, *Does Consciousness*

Cause Behavior? Massachusetts: MIT.

KAKU, M. 2021. *A Equação Divina*. A busca inacabada por uma teoria do tudo e o futuro da física. Lisboa: Bertrand Editora.

KANE, R. 2005. *A Contemporary Introduction to Free Will*. New York: Oxford University Press.

KRAUSS, L. 2013. *A Universe from Nothing*: Why There Is Something Rather than Nothing. New York: Atria Books.

KANT, I. 2008. *The Critique of Pure Reason*. New York: Penguin.

LEDOUX, J. 2019. *The Deep History of Ourselves: The Four-Billion-Year Story of How We Got Conscious Brains*. New York: Viking.

LIBET, B. 1999. Do we have free will? *Journal of Consciousness Studies*, **6**(8-9): p. 47-57.

LOCKE, J. 2008. *An Essay Concerning Human Understanding*. Oxford: Oxford University Press.

MCCANN, H. 1998. *The Works of Agency*: On Human Action, Will, and Freedom, Ithaca: Cornell University Press.

MCKENNA, M.; COATES, D. J. 2024. Compatibilism, *The Stanford Encyclopedia of Philosophy* (Summer 2024 Edition), Edward N. Zalta & Uri Nodelman (eds.), URL = <https://plato.stanford.edu/archives/sum2024/entries/compatibilism/>.

MELE, A. R. 2000. Goal-Directed Action: Teleological Explanations Causal Theories, And Deviance. *Philosophical Perspectives*, **14**, Action and Freedon.

METZINGER, T. 2009. *The Ego Tunnel. The Science of the Mind and the Myth of the Self*. New York: Basic Books.

O'CONNOR, T. 2000. Causality, Mind and Free Will. *Philosophical Perspectives*, **14**, Action and Freedom.

PEREBOOM; D. 2007. Hard Incompatibilism. Four Views on Free Will (eds. FISCHER, J. M.; KANE, R.; PEREBOOM, D.; VARGAS, M.) Oxford: Blackwell Publishing.

RAMACHANDRAN, V. S.; HIRSTEIN, W. 1997. Three Laws of Qualia. What Neurology Tells Us about the Biological Functions of Consciousness, Qualia and the Self. *Journal of Consciousness Studies*, **4**(5-6): p. 429-458.

SCHOPENHAUER, A. 2005. *Essay on the Freedom of the Will* - Dover Philosophical Classics. New York: Dover Publications.

SAPOLSKY, R. M. 2023. *Determined* – A science of life without free will. New York: Penguin Press.

SERRADO, R. 2024. Free Will and the Misconceptions of indeterminism. *In press*. In https://www.researchgate.net/publication/381732498_Free_will_and_the_misconceptions_of_indeterminism.

SETH, A. 2021. *Being You*. A New Science of Consciousness. London: Faber & Faber.

SLATTERY, T. 2014. *Breaking The Free Will Illusion*. For The Betterment of Humankind. [s.l.]: Working Matter.

SOON, C. S; BRASS, M.; HEINZE, H.; HAYNES, J. 2008. Unconscious determinants of free decisions in the human brain, *Nature Publishing Group*, **5**: p. 543-545 doi:10.1038/nn.2112.

SPINOZA, B. 2005. *Ethics*. New York: Penguin.

WEGNER, D. 2002. *The Illusion of Conscious Will*. London: The MIT Press.

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