

[Determinism, Free Will, and Moral Responsibility](#)

The Modular-with-Feedback Theory of Free Will: Challenging Determinism, Compatibilism, and Sundry Libertarians

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Free will is a genuine, real property of the human condition, a stance that overthrows conventional arguments.

Suppose that a man pulls the trigger of a gun. Mechanistically, the muscles in his index finger contracted because they were stimulated by a neuron having an action potential (i.e., being in a particularly excited state). That neuron in turn had its action potential because it was stimulated by the neuron just upstream. Which had its own action potential because of the next neuron upstream. And so on.

Here's the challenge to a free willer: find me a neuron that started this process in this man's brain, the neuron that had an action potential for no reason, where no neuron spoke to it just before. Then show me that this neuron's actions were not influenced by whether the man was tired, angry, stressed or in pain at the time. That nothing about this neuron's function was altered by the sights, sounds, smells and so on, experienced by the man in the previous minutes, not by the levels of any hormones circulating in his brain in the previous hours to days (and so on ...).

Show me the neuron being a causeless cause in this total sense ... show me a neuron (or brain) whose generation of a behavior is independent of the sum of its biological past, and for the purposes of this book, you've demonstrated free will.

So wrote Robert Sapolsky in his 2023 critically acclaimed book, *Determined: A Science of Life without Free Will*. If only there was a cash reward attached to his challenge! I'll use the challenge to demonstrate how a new theory beats out determinism, compatibilism, and all the other *-isms* associated with free will.

I'm not alone in pointing out his first error: that the challenge to discover a neuron acting as a causeless cause, independent of its past, would be satisfied by finding a neuron that fired off quite randomly; yet a person whose behavior was governed quite randomly has no free will. Putting this aside, the point Sapolsky aims for is to deny us our free will and even the notion that we are agents at all. Our moral behavior may change, but the decision to change was causally determined. "We can subtract responsibility out of our view of aspects of behavior. And this makes the world a better place."² My task will be to prove our behavior is neither irrevocably determined by the past *nor* a result of random indeterminacy but is instead genuinely free in the sense that for any decision, we could have chosen otherwise.

Background for My View

To understand my view, let us first consider how neurons are activated. In fact, brain neurons do “fire” stochastically when not being acted on, but when stimulated by one or more other neurons—some possibly inhibitory—the summed stimulation may exceed a threshold upon which the neuron may fire a packet of action potentials.

Crucially, as elucidated by neuroscientist Peter Ulric Tse in his theory of criterial causation,³ not only may the neuron, after receipt of several signals, activate the next neuron in the chain, but it may also alter the *criteria*, or the signaling it selects, that will activate it the next time it is stimulated. These are not arbitrary outcomes, yet neither are they entirely predictable. They generate novelty despite being tied to preset criteria for firing. Criterial causation, Tse wrote, “offers a middle path between determinism and randomness.”⁴

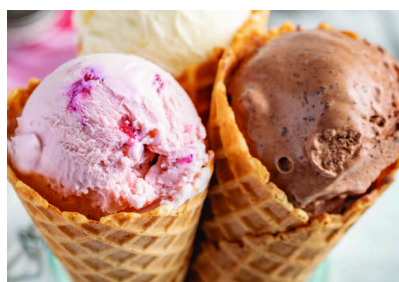
This allows unconscious systems to provide new solutions to meet now modified criteria. First, new criteria are set for firing. Next, a variable input hits the neuron; then, post-synaptic neurons, depending on whether the new criterion was met, either or don’t. The first two steps allow randomness, supervened on by a determined step.

In decision-making, wrote Tse, an “executive system” creates the necessary criteria in the working memory. Unconscious systems then offer decent matches. If these are rejected, it results in a reset of the criteria, and a new offering of randomly different but adequately determined choices.⁵ Tse showed how randomness can be supervened upon by a determined step to give adequately determined choices. I will explain how conscious feedback unites the predictable with the unpredictable element within our behaviors into a freely willed system for which we can be held responsible.

My View: The Modular-with-Feedback Theory

The modular-with-feedback theory of free will⁶ is a new theory that emphasizes the role of conscious feedback in priming or subconscious to offer up choice options that are in keeping with our character. Different ideas, or potential problem solutions are represented by modules of interacting neurons that generate oscillating patterns of activity. The modules are groups of neurons that trigger each other in a repeating pattern that can either fade away or recruit neighboring neurons to expand. In solving any particular problem, the dominant oscillation overwhelms its competitors. Sometimes we become conscious of the result, although much of the time when we are thinking about something else, the dominant oscillation directly activates the relevant motor neurons, such as steering the car as you drive home.

The subconscious process can be compared to a tournament of soccer teams, each team representing a possible choice we can make weighted such that some have much stronger players than others. When we make a conscious choice, these teams face each other and the winner can emerge into consciousness. Imagine being faced with a choice between chocolate and strawberry ice cream. Historically, team chocolate has been the stronger team, winning 70 percent of the time. However, today team strawberry happens to win, and you realize that this particular strawberry ice cream is especially delicious. This conscious realization sends a message to our subconscious, and the weight is reassessed. It is as if team strawberry has acquired a new star center-forward and tomorrow is much more likely to win again.



Ever since our development as children, our choices tend to be rewarded or punished, so we consciously adjust the weight applied to that choice in the future. This occurs even as the weight can be genetically predisposed as in political outlooks associated with fear and disgust, investigated by Jon Haidt.⁷ The weight can also be affected subconsciously by subliminal effects, such as the warmth and roughness of things we are holding, or sunshine, smiling, or hand-washing that are experienced preceding our decisions.⁸ The choices we make have results. We develop our character as a result of the weight we apply to these choices, which determines not how we will behave now but the probability of how we will behave the next time we are faced with a similar choice. As a result, we can expect that tomorrow we will freely choose to make an appropriate choice in a given situation, which for some people may be to pull the trigger of a gun and for others not to. This is because of the weight placed on those two options by our conscious past experience, and this weight will usually subconsciously send up the appropriate decision for our conscious approval and enactment—even in the heat of a moment.

However, it is never guaranteed that we will freely make the appropriate choice, and the pathologies of free will—such as an tiredness, testosterone marinade, drug impairment, or mental illness—may disable our free will in much the same way as a bruised arm impairs our ability to throw a ball. The subconscious weight may then be shuffled or misassigned, or the proffered choice may be consciously overridden. It does not mean that we lack free will, only that in particular circumstances the normal exercise of our will has been impeded.

How do the conscious choices that modify weight arise? For all significant, thought-out choices, these are chosen by our conscious thoughts, and we think about the options at the level of consciousness. The options are mediated by our subconscious, flagged already with consciously preset weight, but, as in any soccer game, the strongest option doesn't always win. This introduces an element of chance. But the winning option (of the subconscious tournament) still must satisfy our conscious character, which has been shaped by the history of previous choices—and their results—since childhood. In this analogy, the conscious character is equivalent to the manager of the team, responsible for its results, and able to alter the squad or its tactics or bring on a substitute, according to past or even current performance. Not each decision but rather the *result* of each decision imprints itself on our subconscious through reapportionment of weight and consciously affects our character.

So, unlike Sapolsky, who says our choices are (pre)determined by our past history, I maintain that our choices are strongly influenced, but not fixed, by positive or negative feedback from the results of past decisions (and the history that necessitates making them). This includes, first, a random element (which interrupts any causal sequence), explaining why we sometimes blurt out stupid remarks or discover surprising new abilities that we possess. It also includes conscious supervision, which is responsible for analyzing the results, and the subsequent reset of weight, which we freely, rationally, choose.

Don't conscious choices have to be caused? Of course, our free will is caused, otherwise it would just be random activity, but caused *not* by an unbroken chain of causal interactions but by a causal interaction with a random element, which can lead to surprises, mistakes, character-building, and, most of all, learning. How our consciousness can physically cause the reset of our subconscious weighting is part of the mind-body problem, which I addressed in "The Self, Its Brain, and a Solution to the Mind-Body Problem"⁹ and "How Entropy Explains the Emergence of Consciousness: The Entropic Theory."¹⁰ That it is able to do so, however, is attested to by the experiments of Jeffrey Schwartz. The reference to Schwartz and Begley¹¹ is important. In his work on treating obsessive compulsive disorder (OCD) patients, Schwartz showed that by training people to use their conscious thought processes alone, he could not only alleviate their OCD, but he could demonstrate physical, material changes to brain tissues visible on PET scans. Conscious thinking can change our neurons. This disproves the notion that our conscious thoughts are an "epiphenomenon" riding on top of, but unable to alter, underlying brain mechanics. Therefore, our thinking that we will do something can actually be the cause of our doing it, which is necessary for free will.

Neurons in the brain belong to circuits, often several at any given time, and their normal function can generate thoughts.¹² If thoughts may clash. However, subconscious circuits, or modules, normally compete with each other with probability weights adjusted by past experience to yield an adequately determined conscious decision that is yet compatible with randomness. Because of this, I call this an "inverse compatibilism." It is not compatible with traditional determinism in part because the universe is not physically determined in an absolute sense.

To drive this home, let me cite Richard Feynman and Stephen Hawking, respectively: "We do not know how to predict what would happen in a given circumstance, and we believe now that it is impossible—that the only thing that can be predicted is probability of different events"¹³ and "Quantum mechanics therefore introduces an unavoidable element of unpredictability and randomness into science."¹⁴ It's also worth considering Richard Muller: "We can't predict when an atom will disintegrate, and the Laws of Physics, as they currently exist, say this failure is fundamental. If we can't predict such a simple physical phenomenon then how can we imagine that someday we will be able to show that human behavior is completely deterministic?"¹⁵ Philosophers can no longer baldly state that the universe is determined and expect us to accept it. We have moved beyond the classical physics of Isaac Newton and David Hume.

Yes, particles always follow physical laws. There is quantum indeterminacy, but "weird" quantum behaviors mostly disappear at classical scales due to a process called "decoherence." However, several important biological systems reflect the effects of quantum indeterminacy, including photosynthesis in plants,¹⁶ navigation in birds,¹⁷ odor detection in mammals,¹⁸ disease fighting by ferritin molecules,¹⁹ and microtubule functions possibly linked to the origins of life and consciousness.²⁰ In other words, they take advantage of, and *depend* on, indeterminacy effects that can only occur at the quantum level and utilize the effects before they can decohere to generate physiological effects that we appreciate at the classical level.

It is true that we can have predictable probability distributions for the cumulative effects of random motions; for example, meteorologists are able to forecast weather patterns ten days from now though not much further. But we also have genuine unpredictable events, such as the when and where of the radioactive decay of specific atoms and whether that will lead to a neoplastic transformation. This is because the effect of a given mutagen event depends on the past history of the DNA on which it impinges. Tumorigenesis is the result of the cumulative effect of various epigenetic modifications.²¹ We know that if we st

with 1,000 radon atoms, after 3.8 days, 500 will have decayed, yielding mutagenic alpha particles. The more fateful question facing a recently sensitized oncogene in your lung cells is whether this particular radon atom you just inhaled will decay before you exhale it. If you could go back in time just an hour and restart the planet Earth exactly as it was then, there would be radioactive decays in some places that happened differently, with different outcomes, and this would change the future.

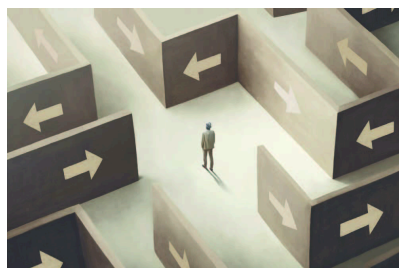
This uncertainty doesn't *generate* free will. What it does is show that a theory of free will must be compatible with *indeterminism* not determinism. Those philosophers whose argument depends on a completely determined universe must shoulder the burden of proving that it is so. The simplest proof that it is not determined can be found in my paper on emergent phenomena.²² Hard determinism requires that a "Laplacian demon" would be able to predict every event in the future from the beginning of the universe. An emergent phenomenon is one that, by definition, cannot be predicted by a complete understanding of the underlying (determined) level of organization. Although self-organizing structures and the evolution of complexity follow predetermined rules, as Sapolsky emphasized, the emergence of classical from quantum physics, the emergence of life from molecular biology, and that of consciousness from neurons have not been shown to have a predetermined origin or even an explicable one, and it would seem that these events must have come as a surprise to Laplace's demon. Because we are classically living, conscious entities, we cannot have been predetermined.

But let's assume, as devil's advocate, that the outcome of a soccer game is predetermined by the arrangement of all the atoms in the players' brains, boots, and the bounciness of the ball before the game ever starts—like a complex game of billiard balls bouncing off each other at predetermined angles. The goalie couldn't help but have flubbed that easy save, just as you had no alternative but to choose the strawberry ice cream. This has a relatively trivial effect on the modular-with-feedback theory even though the outcome of your decision-making is now determined by the weight you gave the choice options beforehand. Nonetheless, these are based on your conscious character plus the reaction of the world in general to your previous choices. There is no known mechanism whereby your conscious thoughts are determined by any specific neuronal activity (or vice versa). Due to the mysterious nature of the emergence of consciousness, you are free at the conscious level to reassign the weight of each decision, even as you try to score a winning goal.

Or let's assume that we could determine how each thought arose from a specific pattern of neuronal oscillations and then automatically proceeded to generate a behavior, leaving our thought as an epiphenomenon. In a nondeterministic universe, choices would still be affected by the random element of the subconscious tournament, and we would remain responsible for the weight we preassigned the modular options. Therefore, to falsify the modular-with-feedback theory, it would be necessary to prove both that the universe is deterministic *and* that consciousness is an epiphenomenon.

In answer to Sapolsky's challenge: Seeking a neuron at the start of a chain that is a causeless cause is a category error, like asking what color intelligence is. Being caused does not make an action, or our free will, determined. Our character has been caused by the results of experiences following past decisions. These include imposed punishments and rewards but also an element of randomness as to whether any given decision, such as the striker's decision to shoot for goal, will turn out well or ill. Free will is not determined like the knock-on of billiard balls. It is messier than that, more like a game of soccer. Randomness has been included in the modular-with-feedback theory in such a way as to allow both adequate determination and, through feedback, genuine will.

Therefore, for the purposes of Sapolsky's book and more, I've demonstrated free will.



Discussion of Sapolsky

Having said all that, Sapolsky in particular seems more focused on our personally being determined than on universal determinism. In his chapter "Is Your Free Will Random?,"²³ Sapolsky seems to acknowledge, albeit often dismissively, that rare events may occur. The chapter follows one on quantum "weirdness," which acknowledges that "the subatomic universe works at a level that is fundamentally indeterministic on both an ontic and epistemic level."²⁴ From here, Sapolsky considers whether quantum effects in the brain may be amplified in such a way as to contribute to free will. He notes:

²² See my paper on emergent phenomena, *Emergent Phenomena*, available at www.kenrick.com.

In Tse's view, the location of the magnesium [atom in a glutamate receptor] can change in the absence of antecedent causes, because of indeterminate quantal randomness. And these effects bubble up further: "The brain has in fact evolved to *amplify* quantum domain randomness ... up to the level of neural spike timing randomness" ... and the consequences ripple further into circuits of neurons and beyond.²⁵

However, Sapolsky rejects Tse's bubbling-up analysis. Here and throughout the chapter, Sapolsky's point is that these random occurrences lack any mechanism to influence a brain to decide something one way or the other. Nor does he concede they are necessarily random, citing various potential modifiers. Determined indeterminacy, he suggests, is deterministic neurobiology making unpredictable neuronal events more or less likely to occur; this does not imply that quantum randomness is an uncaused cause.²⁶

Rather than focusing on the hard determinism of Laplace's demon, Sapolsky focuses on what Alan Johnson called "*ad hoc*" determinism.²⁷ This can be characterized by the "I was raised by abusive parents in a crime-ridden neighborhood; therefore, tragic circumstances made me do it" defense. It has long been known that heritable components influence important character traits, including intelligence, novelty seeking, fearfulness, aggression, and violence. It is estimated that our genetics contribute approximately 50 percent of the influence on our behavior.²⁸ We are also influenced by our epigenetic familial history.²⁹

Sapolsky examines at length the role of our genes, neurotransmitters, hormones, regional brain organization, environmental factors, climate, stress, gut bacteria, stage of brain maturation, upbringing, cultural heritage over many generations, and sheer luck to claim a seamless firewall against free will in which no neuron exists that has not been influenced by what has come before. It's all very interesting and thoroughly researched. According to the modular-with-feedback theory, these factors structure even pathologically, influence the weight we apply to different subconscious choice options. However, with the exception of brain pathology, this does not invalidate the competition between choice options, and the subsequent conscious feedback, gives us free will. There is no Law of Determinism that always prevents one from overcoming adversity to pursue one's chosen dream, nor is there one that prevents scions of the privileged from squandering everything through bad choices.

Eleven years before Sapolsky dropped his 511-page blockbuster, philosopher and neuroscientist Sam Harris published his *Free Will*, which made similar arguments in a slender eighty-three pages.³⁰ Presaging Sapolsky, Harris wrote: "if determinism is true, the future is set—and this includes all our future states of mind and our subsequent behavior," though he does acknowledge evolution, being driven by random mutations arising from cosmic rays subject to quantum effects, "seems unpredictable in principle."³¹ But free will is an illusion.³² Intentions don't originate in one's consciousness, according to Harris; they appear there.³³ The modular-with-feedback theory places intentions, and decisions leading to them, in our consciousness but only because they are subconsciously selected for projection there, a process that takes into account feedback from previous similar situations which is guided by (despite a random element) a perceived need to maintain one's character. While Harris argues that we can separate our will from our reward process, we can indeed consciously decide to tag our reward process with weight that rewards changes in our future behavior.

Harris ridiculed the idea that we could be free to choose that which we didn't happen to think of, e.g., a glass of juice when I had chosen water over beer.³⁴ But we are indeed free to reject both beer and water and request our subconscious to keep sending up new ideas until it hits upon the idea of juice. These thoughts of beverages may be deterministically caused by our physiological sensation of thirst and our conscious desire to quench that thirst, but our choice between beverage options is not freely due to the role chance plays in our subconscious selection process, coupled with the weight that we have historically chosen to assign to those options and our ability to consciously reject options and demand new ones.

"You can do what you decide to do—but you cannot decide what you will decide to do."³⁵ Harris notes you can purge the house of sweets if you wish not to eat them, but you can't know why you didn't do it yesterday. You may have sufficient will power to change your life, he added, but that is luck, and you can't make your own luck. But we often make our own luck, through our choices in how to behave. Our free will can build the motivation to throw out the sweets by training the subconscious not to want them, especially through tagging the "eat sweets" option with emotions such as nausea or disgust. Will power seems to vary between individuals and is subject to pathologies of free choice such as hunger, tiredness, anger, drugs, circadian rhythms etc. Our motivation to hold to a resolution is driven by the flow of dopamine, serotonin, and noradrenaline in our brain's reward system but we can influence through feedback whether we are motivated more by food or by body image.

The Compatibilism of Daniel Dennett and His Argument with Sam Harris

The late Daniel Dennett was a compatibilist philosopher. He believed that, despite a determined universe, we possess a variety of free will. He reviewed *Free Will* by Sam Harris and argued that it attacked only the flawed “popular” idea of free will.³⁶ Dennett was known for insisting that consciousness is an illusion (physically merely being the winner of competing circuits, especially when commandeering the language center and forming memories),³⁷ but he turned on Harris, ironically, for insisting that free will is an illusion: “We don’t think free will is an illusion at all, but rather, a robust feature of our psychology and a reliable part of the foundations of morality, law and society.”³⁸ He proposed a “more sophisticated model” consistent with neuroscience and introspection, allowing a version of responsibility able to justify blame and reward. (He had earlier written in *Freedom Evolves* “But I cannot deny that the tradition also assigns properties to free will that my varieties lack. So much the worse for the traditions, say I.”³⁹)

He then noted how his choice at time t can “bias the settings in his brain” that can subconsciously influence his choice at t^1 , he developed this into an introspective means to improve our self-control, yielding moral responsibility.⁴⁰ But failing to see the role of chance in selecting between differently biased options, he was left with “so long as one can get what one wants so wholeheartedly, what could be better?” In *Freedom Evolves*, Dennett proposed that “though our futures are fixed, our nature is designed through evolution to be able to change in response to our interactions with the world. To the ‘God’s eye view’, not changes in the Universe, but from the agent’s perspective, things change all the time, and agents change to meet the changes.”⁴¹ “Our thinking tasks get outsourced to semi-independent neural subcontractors in competition with each other, but the thinking still has to get done, and wherever thinking gets done, *people do things for reasons that are their reasons*.”⁴² Our intentions may be caused, as Harris claimed, by events in our brains that we don’t intend, but this, said Dennett, “is the very epitome of freedom: you have the ability to intend exactly what you think to be the best course of action.”⁴³ Determinism (events are caused by past history) is different from fatalism (the future is inevitable), and Dennett wanted to create a gap and squeeze free will out from between the two. Although we could not have chosen to do differently than we did, the option was there, we had “elbow room” to choose between alternate worlds, said Dennett.⁴⁴

But as many have noted, none of this is free will; it’s a determined will, unable to do otherwise, no matter what Dennett calls it.

The debate between Harris and Dennett continued with Harris accusing Dennett’s argument of having performed “conceptual surgery” to make free will presentable.⁴⁵ Harris emphasized the distinction between the first-person experience of mind (seemingly free) and the third-person theory of mind (subconsciously determined). We may feel free, but our subconscious brain activity is determining our choices.

However, Harris’s discounting of the role of conscious thought is contradicted by the work of Schwartz and Begley, which showed that conscious thoughts can directly alter the underlying structure of the brain, which can be seen on PET scans.⁴⁶ In a particular case, participants had to be learned through attending a four-step program to treat OCD, which means they could not have been determined by the history of the participant. Although the participants were arguably determined by their participation in the program, the process was one of acquiring the program’s concepts consciously and then consciously deciding to impose those thoughts onto the underlying brain structure. Were the participants not freely willing to do this, their predetermined participation in the program would have ended in failure. The first-person experience may, in fact, direct the third-person subconscious mind.

Determinism, Compatibilism, Free Will, and Punishment

Sapolsky and Harris agree that criminals aren’t morally responsible for their crimes and that we shouldn’t blame them or hate them for what they’ve done any more than we should rail against the immorality of a tornado or an earthquake. However, although the *ad hoc* determinism of the “My impoverished and abusive upbringing made me do it” defense is real, it is not, as Harris would have it, inescapable. Many kids overcome such backgrounds and win college scholarships; it is a matter of determination, not determinism!

Sapolsky favors the Norwegian model of criminal justice, citing Anders Breivik,⁴⁷ who killed seventy-seven people, mostly teenagers, in an act of Neo-Nazi terrorism in 2011 and is serving twenty-one years in a relatively comfortable jail. Sapolsky asks: Once Breivik is determined no longer to be dangerous, why jail him at all? Such would be the unpalatable consequences of determinism, but compatibilism is no better. Compatibilists cannot arrive at “alternate-possibilities” free will (free to have done otherwise) but claim an “actual-sequence” freedom, that is, the ability to act without coercion. The compatibilist would thus argue that Breivik, having not been coerced to terrorize Oslo that day, acted out of free will *even though he had no alternative possibility*. Surely, if he could not have acted differently, he could not, logically, be blamed.

It is only through the modular-with-feedback theory that we can assign real responsibility, blame, and justifiable punishment criminals such as Breivik, who, regardless of his state of mind that day, freely chose to immerse himself in his hateful worldvi

Libertarianism

Libertarianism is also called “incompatibilism,” *vis a vis* determinism. Libertarians insist that we control our decisions through some element able to stand outside the chain of causation. The principal problem with their view is just that they cannot give a realistic account of how this can occur.

Robert Kane's libertarianism holds almost to determinism, except that he allowed individuals to experience rare self-forming actions when an extremely important decision is needed. At that point, they break free of determinism by some unexplained mechanism. Kane suggested that such stressful uncertainty can move appropriate brain regions away from thermal equilibrium stirring up chaos, sensitizing it to micro-indeterminacies at the level of neurons.⁴⁸ Of course, and Sapolsky agrees,⁴⁹ this still doesn't provide a credible mechanism for freely making a controlled decision one way and not the other.

Kane skirted the modular-with-feedback theory, considering the choice of a businesswoman on her way to an important meeting who witnessed an assault in an alley to intervene or not.⁵⁰ He discussed the struggle between two “recurrent and connected neural networks,” which interfere with and feed back on each other until one wins the tug of war to provide the decision. He never seized the point that feedback comes *after* the result of the decision has been assessed, changing the weight the two neural networks will carry when they reengage in the future.

Robert O. Doyle advocated a two-stage model of free will.⁵¹ The subconscious, he wrote, can generate options in a quantum indeterminate fashion; a conscious, determined decision is then made between these options. As Doyle noted, other philosophers, beginning with William James in 1884 with his lecture “The Dilemma of Determinism,” have described similar two-stage models. They try to justify a libertarian free will layered on top of random indeterminism. By adding a layer of determinism to a probabilistic one, they make the claim that they have created an adequately determined theory. They are all flawed in that without a feedback mechanism, they fail to allow change to the character of one's deterministic layer. What libertarianism has been missing is mechanism. It has been missing the modular-with-feedback theory.

Conclusion

According to the modular-with-feedback theory, we are, when not pathologically compromised, adequately but incompletely determined. Free will, arising from subconscious competing modular mechanisms subject to conscious feedback, makes us free because the mechanism allows us to choose between randomly selected elements but also responsible because the mechanism governing our choice, being consciously weighted by our prior choices, allows us justifiably to feel that the choice was ours. The extent of the role of chance is hidden by the mechanism, but it is sufficient to preclude determinism and compatibilism. This is why, due to its compatibility with *indeterminism*, I call it an inverse compatibilism. Through this mechanism, we are neither determined nor random but in between them—free.

Notes

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