

# The Modular with Feedback: Theory of Free Will

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## Abstract

In this theoretical article, I propose free will to be compatible, not with determinism, but with chance. This paper provides a neurological model of how free will emerges from oscillating neuronal activity, in modules. These, representing ideas, oscillate subconsciously, competing for conscious attention; choice between them is partly random. The modules seek to maintain, homeostatically, a sense of context and consistency; and a conscious desire for a sense of character and personality. I propose that they learn from experience, using feedback to rebalance, so that decisions conform to our desired will. This applies to "snap" decisions, but also to our moral core. Particular experiences influence our future moral judgments such that we accept responsibility for our generally but not entirely predictable decisions. The model explains will power, pathologies (i.e., addiction, "ego-depletion") and links free will to creativity and humor. The Modular with Feedback theory of free will grants us freedom through a plastic control the uncertainty of which isn't understood, but which is sufficient to preclude determinism.

**Key Words:** free will, modular, feedback, inverse compatibilism, plastic control

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## Introduction

In this paper, I will demonstrate that free will is a genuine property of the human condition, with the features not only of enabling us to choose the way we want to choose, in keeping with our character, but also of meaning that we really could have chosen differently.

The debate on Free will has traditionally held that our choices are made through either a "hard" or "soft" version of determinism. According to the "hard" version, our decisions have been determined since the origin of the Universe leading to the starting positions of the

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atoms in our brain cells when we are born. This scenario is incompatible with our possessing Free Will. Those who adopt a “soft” version hold that Free Will is in some sense “compatible” with a deterministic Universe. This, it is claimed, occurs either through real choice being hypothetically possible under rare circumstances, or it occurs if moral authorship of our actions follows from our being their source, whether or not we choose them. We are predetermined to want to make the decisions that we make, so therefore our decision-making is compatible with free will, even if we could not have chosen other than to commit a crime, for instance. The much-feared alternative to determinism would be a chaotic buffet of random choices, where we would act out each momentary whim, lacking all self-control. This view, and its associated contrivances to limit our choice-making to something for which we could be held responsible, is called “libertarianism”. Because it claims Free will to be incompatible with determinism, it has been awarded by some philosophers the moniker “incompatibilism”. All of these notions have in common that, if correct, society couldn’t justify holding any criminals responsible for their actions. These ideas are fortunately ignored by our courts and law-makers, but advocates for one another of these views tend regularly to challenge the justification for punishment in the criminal justice system.

### The physics of determinism

A few words will clarify the full consequences of different views on being predetermined. Many philosophers have argued that, since particles have always followed the physical laws of motion since the start of the Universe, a watchful superintelligence would have been able to follow each one’s trajectory and know not only where it is now, but where it will go and what it will interact with into the future. Though massive in number, the calculations are as clear cut as plotting the angles of where all the billiard balls will go when you take your first shot. According to this view of determinism, if you were telephoned as a wrong number, and as your phone rang the tea-kettle simultaneously began to boil, this coincidence would have been the inevitable result of determinism. Many physicists deny this. Early in the last century, Arthur Holly Compton wrote in *“The Freedom of Man”* (Compton, 1935) “it is no longer justifiable to use physical law against human freedom”. Compton was well acquainted with the Uncertainty Principle of Werner Heisenberg, having written the preface for Heisenberg’s first book. Albert Einstein was among the physicists who thought otherwise. Regarding the Uncertainty Principle, he exclaimed that God does not play dice! He expected that our uncertainty was not fundamental, and related only to our *knowledge* of the quantum state. The quantum state, he maintained, remained deterministic due to “hidden variables”. However, in 1964, John Stewart Bell proved that any quantum theory with hidden variables must permit instantaneous

interaction between particles no matter how far they are separated, a feature that goes by the name of nonlocality. Nonlocality results from Heisenberg's Uncertainty (Oppenheim and Wohler, 2010). This completes a full circle, to God playing dice with Einstein and determinism (Tse, 2013 adapted from appendix 1). Professor Richard Muller commented on this uncertainty in "Now: The Physics of Time" (Muller 2016 p. 268): "We can't predict when an atom will disintegrate, and the Laws of Physics, as they currently exist, say that 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?" The Health Physics Society website "*Are Our Bodies Radioactive?*" (hps.org, 2016) elaborates on how radioactive decays take place in our bodies at a rate of thousands per second, or about 10% of the typical radiation we receive as background from our environment. This represents a lot of indeterminism. Stephen H. Kellert describes in "In the Wake of Chaos" (Kellert, 1993) such features as turbulence, chaotic dynamics, the fractal nature of strange attractors, and the sensitive dependence on initial conditions for systems confined to them, and Lyapunov exponents, to point out the limitation on the predictability of physical systems, which "straddles the putative line between theoretical and practical impossibility by presenting us with examples of tasks so difficult that the very fact that we are finite beings makes us unable to accomplish them" (p. 47). These chaotic dynamics have been dubbed the "butterfly effect", and it follows that an unfortunate combination of indeterminist radioactive decays must have already caused cancers that terminated the careers of prominent people who would otherwise have gone on to dramatically change our lives. Ilya Prigogine, in "The End of Certainty" (Prigogine, 1997), discusses the fundamental nature of uncertainty, although he suggests that chaotic effects are more important. This, he said, is because they are driven by time-irreversible processes dependent on entropy. Henry Stapp, in "Quantum Theory and Free Will" (Stapp, 2017 p. 26-27), wrote "[t]he quantum resuscitation of the causal power of our thoughts overturns the absurd classical notion that nature has endowed us with conscious minds whose only power and function is to delude us into believing that it is helping us to create a future that advances our felt values, while in actuality that future was predetermined 15 billion years ago". David Layzer, in Scientific American, explained that the expansion of the early Universe, at a rate faster than which matter and radiation could move into the new space, led to departures from thermal equilibrium which represented macroscopic information and the creation of novelty (Layzer, 1975). This contradicts determinism. Ruth Kastner considered her Relativistic Transactional Interpretation of Quantum Mechanics to be most appropriate in defiance of Einstein's deterministic Blocktime Universe (Kastner, 2013). Roger Penrose's used his Orchestrated Objective Reduction theory of consciousness to solve the problem of how athletes can rapidly make

a “decision” i.e., which way to hit a fastball, much too quickly for the brain to decide, if it had to rely on classical physics, where to swing their arm (Penrose, 2023). This is achieved, said Penrose, through the transient retroaction of the collapse of quantum superposition. Because this comes from the future, there is room for a non-computational quantum element that cannot be determined by the past, and may allow free will. Peter Lugten’s *Entropic Theory of the Emergence of Consciousness* explains that, by definition, the nature of emergent phenomena is unpredictable even if given a complete understanding of their underlying level of composition. We can say, as a corollary, “that physical determinism is incompatible with the emergent phenomenon of consciousness, and that therefore, since we are conscious, we are not predetermined” (Lugten, 2024).

### Soft (ad hoc) determinism, and causative agency

We can certainly deny the hard determinism of the “kettle boiling/wrong number phone call coincidence”, while, at the same time, acknowledging a degree of truth to the softer, or “*ad hoc*” determinism of the “I was raised by abusive parents in a crime-ridden neighborhood; therefore, my 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 to give or take 50% of the influence on our behavior (Bouchard *et al*, 1990). We are also influenced by our epigenetic familial history (Holliday, 2006). This is above and beyond obvious physical constraints, such as that as a man, I will never decide whether or not to continue my pregnancy. One may be too short to choose a professional career in basketball, or too robust to be a jockey; likewise, disabled people face limits on their choices of activities. Indeed, as a human, I am unable to decide whether to fly from rooftop to rooftop, or, instead, to alight on yonder tree. But clearly, growing up in a disadvantaged neighborhood can make it easy to slide into a life of crime. Even so, children can overcome genetic and environmental challenges, overcome the temptation to join a gang, and do the work needed to win a scholarship. Determination is what counts, not determinism.

The current trend for philosophers and physicists is to consider the nature of causation to be more important than the question as to whether or not we are determined. There are debates as to the existence of causality, and if it does exist, does it exist at the level of quantum physics, or does it occur at the level of consciousness (Musser, 2023, p. 197-202). From this, some have claimed that being part of the causal (as opposed to random) flow is a requirement for freedom. This argument is, from the perspective of the outsider, essentially determinism. It grants you freedom, if you are content with a freedom that is wanting to do what you were compelled to do anyway.

But if causation is to be found at the level of consciousness, we become free in the sense of “Not only did I make this as a genuine choice, but I could have chosen otherwise”. Still others have maintained that Free Will, like causation, isn’t either/or but is a matter of degree. A portion of our decision-making is already set by our circumstances, but perhaps the remainder could be measured based on information integration. This would represent our agency. A “Free Will index” has been suggested by cognitive scientists to assess our personal capacity to think about our actions. This index could be used to judge if a criminal was burdened by a curtailed freedom in an *ad hoc* sense, and therefore might be a good candidate for rehabilitation.

I intend in this paper to outline an inversion of compatibilism. My theory of Free will is compatible not with determinism but with random chance. It is based on aspects of the conscious brain’s behavior, particularly its ability to reinforce plastic changes in volitional circuits through feedback. I will introduce the headings of neuroplasticity, consciousness, choices and character.

### The Importance of Neuroplasticity

Conscious decisions can plastically alter the physical brain. Research by professor of psychiatry Jeffrey M. Schwartz showed that Obsessive Compulsive Disorder patients could learn to reduce their symptoms through conscious effort. This resulted in physical alterations to their brains’ basal ganglia visible on a PET scan. In his “The Mind and the Brain: Neuroplasticity and the Power of Mental Force” (Schwartz and Begley, 2002 p. 93-94), he wrote “The results achieved with OCD supported the notion that conscious and willful mind differs from the brain and cannot be explained solely and completely by the matter, by the material substance, of the brain... self-directed brain changes - neuroplasticity - are a genuine reality”. In particular, this means that consciousness itself has real agency, is able to direct and cause changes in the brain, and is not a mere, powerless, epiphenomenon.

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### The Nature of Consciousness

In “The Feeling of what Happens”, Dr. Antonio Damasio described an “extended form” of consciousness, whereby patterns of thoughts and expectations based on our subconscious relate environmental awareness to our self-awareness (Damasio, 1999). The brain not only makes use of a sensory model of the outside world, it also maps each region of our bodies such that perturbations, which register as sensations or feelings, then trigger homeostatic corrections. The corrections then generate maps of their own, and this allows us to feel viscerally how we have been affected by the changes. This ability to feel the changes that our minds provoked enables the brain logically to infer that it owns, and is the causal force behind, the bodily tissues,

its mental feelings about those tissues, and the activities directed by it involving those tissues. A “core” consciousness results from the conjunction of these maps and this is recognized as a property of the individual. It creates the “autobiographical self”. It generates a “stream of consciousness” that builds upon the activity of the subconscious as it perceives, solves and acts on problems, and, briefly delayed, conveys to the consciousness sufficient information to understand the situation. This delay was the subject of experiments refined by Benjamin Libet in the 1980’s. He showed that voluntary movements are initiated in the cerebral cortex 1/3rd of a second before we realize we have decided to act. Nonetheless, in the last 150 milliseconds of this period, subjects consciously could reverse a decision that had already been triggered by a wave of cortical activity. Libet wrote “Apparently, the conscious mind could intervene, in the final stages of heightened neurological activity, either to block the already initiated movement or let it pass” (Libet, 1989). It has been argued that these experiments of Libet’s, and subsequent experiments measuring these “readiness potentials”, are proof that we are subconsciously governed “philosophical zombies”. Our consciousness can only watch but not control. The experiments behind these claims have been reviewed by Andrea Lavazza (2016), Peter Ulric Tse (2013) and William R. Klemm (2011), who agree with Libet’s conclusion that we can consciously intervene before acting. In other words, we possess “free won’t”. Notwithstanding the demonstration by Filevich *et al* (2013) that such a veto would, itself, require antecedent, preconscious brain activity, they argue that the artificial nature of the experimental set-up tells us very little about the kinds of decisions we normally make in real life. In particular, Alessandra Buccella and Tomas Dominik referenced work by Uri Maoz and Liad Mudrik in 2019 that found readiness potentials preceding only meaningless decisions, not meaningful ones (Buccella and Dominik, 2023). Klemm made the point that the subconscious can initiate only those actions with which it is already familiar. No one, Klemm argued, has ever subconsciously learned to ride a bicycle or play the piano. Not only the decision to learn these skills, but their successful accomplishment, are conscious examples, even painstakingly so, of the exercise of free will.

Consciousness is directed, or, as philosophers like to say, has “intentionality”. Most of our waking hours are spent trying to solve some problem or other. Meanwhile, our subconscious may be busy supervising another task. As long as the input from our senses matches our expectations, that task won’t intrude. As soon as there is a discrepancy, our subconscious jolts our consciousness to pay attention.

Consciousness appears to reside on the left side of our brain, associated with our language centers. In surgically “split brain” patients, the left hemisphere can consciously word our inner voice monologue, and will happily lie when necessary to maintain self-consistency. As discovered by Michael Gazzaniga, and described in

“Who’s in Charge? Free Will and the Science of the Brain” (Gazzaniga, 2011), the “split brain” patient’s left hemisphere will communicate a false rationale for thoughts based on a masked and thus unknown input provided to the right hemisphere. He named the network in the left hemisphere responsible for this necessity to create a coherent narrative “the interpreter”. However, Dr. Gazzaniga believed our actions to be governed by determinism, and, in this, I intend to determine that he was wrong.

If our conscious decision-making activity occurs half a second after the decision has already been made, why would we bother to put it into words? For most people, narratives are an extremely important feature of our conscious life. Upon deciding, consciously or subconsciously, typically, we consciously verbalize it, and I believe there are 3 reasons for this. First, so that our decisions can be justified to others, we have to be able to understand them in words ourselves. Secondly, for us to remember the detailed reasons behind our decisions, we need to memorize them in worded form. Third, so that we recognize the decision as a personal one that we will accept responsibility for, we must be able to put it into words. Then we can weigh the pros and cons, calculate the likely consequences and prepare for them in advance. When we successfully adopt responsibility for the decision, this fortifies the subconscious process that made that decision. Consequently, it becomes increasingly likely that its future decisions will be consistent with our character.

### Competition between Conscious Choices

Studies suggest that we each have competing networks within our brain offering up potential solutions to pressing problems, and the winner is chosen on the basis of its being most consistent with the narrative underlying our character. For example, Stefan Bode and coworkers reported that in tasks involving free decisions, that is, uninformed guesses, active competition between neural representations, embodied in the dynamic states of decision networks, may generate a fluctuating intention for one choice or another (Bode *et al.*, 2014). The history of previous choices, being embedded in the dynamic states of decision networks, can at times become the most important determinant of behavior. Andrea Lavazza wrote that Executive control functions organize everyday behavior, which is not the instant behavior of Libet’s experiments. “They allow us to modulate our behavior, control or change its development according to environmental stimuli.” Also, a feedback results-based mechanism allows us to change behavior based on its effects, and, “finally, they are also necessary for tasks of abstraction, inventiveness and judgment”. (Lavazza, 2016). Various character-building functions have been regionalized to infoldings of the Frontal Cortex. Juri Minxha *et al.* in “Flexible recruitment of memory-based choice representations by the human medial frontal cortex” (Minxha *et al.*, 2020) state:



“Decision making in complex environments relies on flexibly combining stimulus representatives with context, goals and memories... This work reveals a neuronal mechanism in the human brain whereby oscillation mediated coordination of activity between distant brain regions and accompanying changes in strength of representation and/or geometry implements task-dependant retrieval of memory”. Risk assessment, and one’s inclination to take risks, are an important aspect of Free will. Viet Stuphorn gave an account of how Ryo Sasaki *et al* showed in macaques that “two neighboring regions in the frontal cortex together regulate risk attitude in a competitive push-pull-like fashion and can both increase and decrease risk seeking” (Stuphorn, 2024). Furthermore, this could be modified by inputs from other cortical regions. William R. Klemm, in “Atoms of Mind” wrote of Circuit Impulse Patterns: “In the brain, the oscillation frequency and phase relations of electrical activity shift within and among oscillating circuits. I contend that such changes will change the nature of the thought, and, indeed, are a key component of thought itself” (Klemm, 2011 p. 15). This suggests a neural processing that decides between choices by using oscillating neural circuits with a goal of stabilizing our narrative about ourselves in the world. In this way, it maintains mental homeostasis. All this is performed with no central vantage point, such as the conceptual “homunculus” and its surrounding “Cartesian theater”, popularized by Daniel Dennett (1991), since, after all, any homunculus viewing the scene would have be viewed by its own homunculus, and so on.

### A Character Module to rule them all.

Our choices of how to behave in any set of circumstances are best explained by a “modular theory” for solving problems. This theory includes a Character module that sets a standard which the putative solution has to meet. The modular theory could resemble the “pandemonium of demons”, coordinated by a “Joycean (stream of consciousness) machine” that Daniel Dennett proposed in “Consciousness Explained” (Dennett, 1991), but only if the Joycean machine were conscious. The theory is compatible with the Avatar of William R. Klemm’s “Atoms of the Mind”, which creates a sense of self that is able to interact with the external world through its integration with the subconscious. It is also comparable to the circus “Ringmaster” of Ian Stewart and Jack Cohen in “Figments of Reality” (Stewart and Cohen, 1997 pp. 218-224), the “executive system” Tse (2013 p. 147) as well as the “core” consciousness described by Antonio Damasio. In modular theories, specific patterns of neural oscillations form modules, and different modules represent possible solutions to the problem of what to do next. The Character module then makes a choice. It seems reasonable to suppose that this homeostatic function of the brain, being responsible for our sense of self, will be as particular about maintenance of a consistent self-recognition, or



stable personality, as the brain is about maintaining a steady blood pressure. Our choices will thus be constrained but not determined by a sense of context and consistency, and a conscious desire to maintain a sense of character and responsibility. Often it is the subconscious that selects from among a number of candidate ideas the one it expects to be most suitable, but just before acting, we consciously judge it, to either give it a pass, or to veto it. It is inherent in the Modular with Feedback theory that it also accommodates our tendency to sometimes make surprising decisions.

### Free will and feedback loops

The Modular with Feedback theory operates according to the following principle. Let's examine the question "What shall I do next?" In the subconscious, different options will compete for enactment to solve the perceived problem. Bad ideas, or those that run counter to our personality, will quickly fizzle out. But ideas that work toward our personal goals will generate oscillating modular patterns of neuronal firing until the module for one idea is able to inhibit the others, expand to dominate the relevant portions of the cortex, and pass the threshold for implementation. Our likely behavior is partly predetermined by our past experiences, which will result in some neural circuits being stronger than others. But the choices are competing as if in a contest, just as if they were sporting teams, so for each, there is a probability of winning. The choice we make will then depend on which circuit happens to dominate at the moment we choose, or, when we decide to choose.

In order to generate Free will, the Modular model must be dynamic and requires feedback loops. Consider the driver approaching a yellow traffic light. A reckless driver might well decide to accelerate and try to beat the change to red, whereas a careful driver would slow to a stop. In the reckless driver, the module for "Speed up" would oscillate to greater effect than the one for "Slow down", and rapidly exceed the threshold to action. For the careful driver, the reverse scenario would play out. But if the careful driver was really in a hurry, the oscillations might be of equal potency. Now the driver, unable to decide until it is too late, must stop quickly to avoid running a red light. Feedback occurs days later when the reckless driver gets a \$250 ticket in the mail. Suitably punished, the reckless character can consciously decide to reset the oscillation frequencies of the traffic light modules to be more cautious in the future. This same feedback process applies to carefully considered moral decisions as well as to "snap" ones. For instance, Ali found a wallet containing \$250 at the train station, and turned it over to the "Lost and Found" office. Rewarded with just a thank-you, Ali walks away feeling good about it. Remarkably, it happened again some months later. Sadly, Ali is now broke, and is disappointed that there was no reward. When it happens yet a third time, Ali's module for taking the money now beats out the

module for doing the right thing, and Ali keeps the wallet. Ali notes that feedback from experience has resulted in a difference in her character, even if only temporarily.

We can use the Modular with Feedback Theory to disprove the idea that our mental mechanisms are predetermined, when we consider indecision. Take, for example, a multiple-choice examination: you've reached the last question and you know the answer is (b) or (d). Your neural modules oscillate at about half-strength for each possibility with neither tipping the threshold required for a decision. The next thing you know, the docent proclaims that time is up, activating your "decide now" module to choose the pattern that happened to dominate at that particular moment. If we rule out "kettle boiling/ random phone call coincidence" determinism, then the decision between (b) or (d) was in principle unforeseeable. It would be interesting to see if future technological advances enable experimental testing of this idea.

Modular with Feedback theory is consistent with the ideas of neuroscientist William R. Klemm, who wrote "Ultimately, the belief systems that have been embraced by the conscious mind can serve to reprogram our subconscious" (Klemm, 2011 p. 279). Stephen Kosslyn, prefacing a 2005 book by Benjamin Libet (Kosslyn, 2005 p. xiii-xiv), wrote "In addition, "what one is" governs how one actually makes the decision. And making that decision and experiencing the actual consequences in turn modifies "what one is", which then affects... how one makes decisions in the future". Robert O. (Bob) Doyle's "Free Will: The Scandal in Philosophy and How You Can End It" (Doyle, 2011), advocated a two-stage model of free will. The subconscious, he wrote, can generate options in a quantum indeterminate fashion, which are then chosen between consciously in a deterministic manner. This, he claimed, yields adequate determination. As Doyle noted, other philosophers, beginning with William James in 1884, have described similar two-stage models. They have in common that they add a layer of determinism to a probabilistic one, and then 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.

Research by Tse (2013) has elucidated a neural mechanism for modular feedback that he calls Criterial Causation. When neurons communicate at synapses they can alter the criteria that will activate them in the future. A neuron will receive signals from many other neurons. By means of a property of NMDA synaptic receptors, not only may it activate the next neuron in its circuit, but it may also alter the criteria, or the signaling that it selects, that will activate it next time, be it in the near or distant future. These are not arbitrary outcomes, yet at the same time, they aren't predictable, so this generates novelty despite being tied to preset criteria for firing. Criterial Causation, Tse wrote, "offers a middle path between determinism and randomness"

(p. 131). This allows unconscious systems to provide new solutions to meet the now modified criteria by means of a 3-step process. The first is to set new criteria; in the second, a variable input impinges on the neuron, and third, this results in postsynaptic neurons, according to whether the new criteria are met, either firing or not. The first two steps allow for randomness, but the third does not. In the making of a decision, an “executive system” creates proposed criteria that need to be met, posting them in the working memory. Unconscious systems then respond with possibilities that provide a decent match. If the executive system rejects these, it causes the criteria to be modified, resulting in new solutions being offered (p. 147). Tse’s Criterial Causation is a very good fit with Modular with Feedback theory, though he considers the modular oscillations to be epiphenomena. “The Neural Basis of Free Will” does not place emphasis on how we shape our character through the training of our subconscious by means of feedback. Tse does explain that the executive decision of when to stop the process and accept its decision is an event that is both random and adequately determined. He notes that, as in the case of the docent calling time, deciding can be perturbed by a phone ringing during the process. Tse described his theory as an incompatibilist physical libertarianism. In this sense, Tse has “fixed” the problem of libertarianism, but I view it as an inverse compatibilism. Like Modular with Feedback theory, it is compatible with indeterminism rather than determinism.

### Will Power and Pathologies of Free Will

The Modular with Feedback theory also explains weak will, called “akrasia” by Aristotle, and recognized in the kitchen by the overpowering temptation provided by the last slice of cake. In cases such as this, the fighting between “Eat” and the “Don’t Eat” modules can eventually be influenced by our feeling sick after overeating, and the fact that our minds learn to strengthen our will power, motivated by disgust if necessary. Nonetheless, pathological conditions, especially addictions, can interfere with our self-control.

Addictions interfere with the neurophysiology of the “reward system”, a network of circuits located in the brainstem, which is associated with the neurotransmitters dopamine, noradrenaline and serotonin. Addictions can upset, block or even pervert the character module’s normal feedback, which aims to inhibit unwanted urges. The addict still has Free Will, but it is deranged by the disease. Hunger and tiredness also diminish Free Will. Daniel Kahneman and Amos Tversky described what they termed “ego-depletion” that is seen as a result (Kahneman, 2011). Consistency of character is best maintained by reconsidering decisions made in anger, or by counting to ten before saying anything designed to be hurtful.

In addition to, and much more common than overt pathologies of free will, there is failure to apply free will in our lives. As Deepak Chopra explained, writing for Medium.com in May, 2024, every time we act out of habit, dismiss alternative beliefs, and refuse to think for ourselves, we yield over our free will to determinism, which, as he argues, co-exist on a spectrum. We surrender it to the past, which we continually repeat. When we notice this, he says, we should pause, and allow a fresh response to replace an automatic reflex. Not that I would recommend acting out random behaviors, or changing one's religion and political party every 5 minutes, but we should be open to different ideas, thinking through them even when we are not persuaded by them.

### The Link between Free Will, Creativity, and Humor

In addition to being destructive of free will, a deterministic world would be one in which there was no creativity. Any product of our imagination, any novel idea or work of art would be reduced to an automatic result of the history of the Universe, for which we could claim no credit. The Modular with Feedback theory suggests that the same competing modules, representing ideas, that allow for control of our will can also create an unexpected "flash of inspiration". From time to time, a module representing an unsolved problem related to any creative endeavor will hook up with a module representing a surprising and original solution. This mechanism is also key to a vibrant sense of humor, and the ability to extemporize clever remarks. These so-called "aha moments" seem resistant to deterministic explanation, yet we have the ability, as described by Edward de Bono, in his "Lateral Thinking: Creativity Step by Step" (de Bono, 1970), to enhance our creative talents through training. As long as we can sustain "flashes of inspiration", it is hard to deny our free will.

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### Conclusion

In conclusion, the Modular with Feedback theory of free will allows for adequate but incomplete determination of our behavior. As a consequence, our genuine free will provides us with a homeostatic consistency of character, essential to our successful participation in society, and yet with the ability to occasionally do the unexpected. The mechanism grants us choice, making us free. Because the choice is governed by a mechanism weighted by our previous choices, we feel ownership of the choice, making us responsible. The role played by chance in the decision-making mechanism is kept hidden, but is enough to eliminate the possibility of determinism. The Modular with Feedback theory of Free Will grants us freedom through an uncertainty that we only partially comprehend, but which satisfies our emotional requirement for responsibility through self-control. Not only does it enable us to choose to act the way we want to act, but, in a

very satisfying way, it means we really could have chosen to act differently.

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