

Opinion Article

The Riddle of Free Will: A Sub-topic debate in neuroscience.

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The debate surrounding free will has intensified in recent years, marked by a steady stream of publications from both proponents and opponents. This article argues that neuroscientists should not become overly invested in this debate, and specifically, that the concept of free will should not become a central, foundational principle within neuroscience.

Religions and Free will

Tracing the belief in free will leads us far back in history, perhaps to the earliest civilizations. The concept is present in religious texts from the beginning of human history. A key example is the story of Adam and Eve, whose expulsion from the Garden of Eden resulted from their disobedience to God's command not to eat from the forbidden tree. Their inability to adhere to this command led to their punishment – banishment from paradise and the loss of eternal bliss. God did not forgive their transgression, viewing it as a direct result of their free choice. They willingly chose to eat the fruit, and it was this free will that led to their punishment [1, 2].

This principle is a cornerstone of many religions, forming the basis for moral and religious life. Religions often present a path to righteousness and salvation, acknowledging that individuals, through their own free will, can choose between good and evil (often represented by the influence of Satan). Religious teachings posit that this choice determines how individuals will be judged. Therefore, free will underpins religious morality, making salvation a possibility for believers. Religious adherents view exercising free will as a divine mandate, encouraging conscious and voluntary adherence to established principles. Conversely, disobedience is considered a sin deserving punishment, though sincere repentance can lead to divine forgiveness. This belief is often held as absolute, without question.

Philosophers and Free Will

Ancient philosophers employed logic, reason, and theological arguments to explore the concept of free will. For this reason, philosophy has historically dominated the study of human thought, tackling numerous enduring questions that remain unresolved. Indeed, all branches of the human sciences were once within the domain of philosophy. Psychology and law, for instance, drew heavily on the ideas of philosophers, and early legal principles were formulated under their guidance. Extensive discussions on ethics and morality have continued from the time of Socrates through figures like Kant and Sartre.

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This article does not intend to provide an exhaustive review of diverse philosophical viewpoints. However, it's well-established that prominent philosophers, such as Descartes, advocated for free will, while Spinoza viewed the role of will in actions as limited and relative. More recent philosophers have continued this debate. Sartre, for example, argued that the very existence of freedom creates anxiety and turmoil, even if that freedom is illusory.

A central concern for philosophers is whether our actions are determined by our own free will, or are they the inevitable result of external factors and prior causes?

This question has led some philosophers to explore the concept of diversity. They argue that events, like choices or actions, are more variable due to multiple causal factors and the laws of nature, all of which provide sufficient conditions for an event to occur. In contrast, deterministic views suggest that only a single future possibility exists, thus posing a significant threat to our perceived control. This, in turn, raises the critical question: if we are to accept determinism, why should we blame or praise? Why do notions of duty, responsibility, ethics, and religion hold any weight?

These questions are crucial, yet challenging, and historical Persian philosophers have not provided definitive answers for the wider population. Consequently, other philosophers have attempted to justify human free will using reason and rational arguments. The first group, known as traditional compatibilists, proposed a minimalist definition of free will that attempts to reconcile free will with determinism. They defined voluntary action as action free from external coercion (physical force, threats, disabilities, etc.), but not necessarily free from causal laws governing the natural world. For example, if you choose to stop reading this text and do something else, you are considered free because nothing is physically forcing you to continue. Thinkers such as Aristotle (as interpreted by some Madrasian philosophers), the Stoics, and many medieval theologians, as well as Thomas Hobbes, John Locke, David Hume, and John Stuart Mill in the modern era, all pursued this line of reasoning.

Another approach, known as libertarianism, aims to establish the existence of maximal free will and, crucially, argues that free will is incompatible with determinism. Immanuel Kant, a strong advocate for free will, argued that belief in absolute and indefinite free will is essential to ground ethics and true responsibility, even if we cannot fully understand this free-

dom scientifically or theoretically. For Kant, this kind of freedom is a presupposition of our practical reason and moral life. Operating under moral law, in Kant's view, is fundamentally different from operating under scientific laws of nature. Natural laws are externally imposed, whereas moral law is self-legislated. In other words, we are governed by laws we create for ourselves – laws we can choose to follow. From Kant's perspective, our subjective or "real" selves can be free because they are not subject to the constraints of time, space, or the laws of nature. In short, as Guyer notes, Kant's view of free will centres on the concept of autonomy, and this can be seen as the most important concept in his philosophy [3].

Martin Heidegger and Roderick Chisholm are prominent contemporary representatives of Kantian voluntarism. According to Heidegger, Dasein (human existence) is characterized by both existence and transcendence, and this transcendence is the essence of freedom. Dasein, in this view, freely commits itself to existence through its inherent transcendence. To explain free actions not determined by prior conditions, Chisholm proposes "agent causation," a form of direct causality in human actions. In this view, the agent is the determining cause, not merely the determined effect [4].

Harry Frankfurt and Daniel Dennett are pioneers of neo-compatibilism. Frankfurt proposes that freedom is tied to a capacity for reflective self-evaluation: a free person can critically assess their existing desires and choose to act on more rational, higher-order desires instead of base instincts. Gary Watson adopts a Platonic approach, arguing that freedom is the power to control and coordinate one's value system and desire system. Susan Wolf, similarly, suggests that a person is free if they can align their behavior with societal and ethical norms, even if, in practice, they could not have acted otherwise [5].

Lawyers and Free Will

The concept of free will is fundamental to the definition of crime and its punishment. The accused is deemed guilty and deserving of punishment when they are considered to have possessed free will at the time of the offense. This understanding also explains why certain individuals, such as children or those with intellectual disabilities, are not held fully responsible for their criminal acts.

A primary premise for judges when dealing with criminals is that these individuals possess free will. In accepting this premise, they rely on common sense and intuition. Throughout centuries of judicial proceedings and the issuing of verdicts of guilt or innocence, no defendant has claimed innocence based on a lack of free will, nor has any judge issued a verdict of acquittal for that reason. These court proceedings continue daily in various parts of the world without widespread public protest.

Why did neuroscience get involved?

Given the persistent disagreements among philosophers over centuries, coupled with rapid advancements in empirical sciences, particularly in brain imaging capabilities, attention has turned towards neuroscience. Philosophers generally agree that free will is a function or capacity of the brain, as evidence suggests that brain damage or abnormal development can impair free will.

One of the earliest neuroscience studies to challenge the concept of free will was conducted by Benjamin Libet [6]. This research, now commonly known as Libet-style studies, has been replicated in various forms and consistently produced similar outcomes. However, as time has passed, these studies have come under scrutiny, and their capacity to disprove free will has weakened. Many neuroscientists contend that these experiments fall short of providing a clear answer to the question of free will [7,8].

However, neuroscience is distinct from philosophy, and its methods must

align with those of empirical science, emphasizing scientific testing and mathematical analysis. To engage with this topic, neuroscience requires a precise definition of free will, along with concrete examples of a being or human possessing it. Neuroscience would then need to address questions like how free will is formed and how the brain achieves it. These very questions illustrate why free will should not be a central, foundational concept in neuroscience: these fundamental questions lack clear answers. This is not a criticism of neuroscience but rather highlights the ambiguity in the concepts used within philosophy.

Neuroscience focuses on understanding the structure of the nervous system, its functions, and the disorders that affect its performance. Within this context, the brain and its cognitive functions are particularly significant. Neuroscience seeks to uncover the underlying mechanisms of these functions and explain how the brain makes decisions that lead to behaviour. Indeed, our brain's capabilities have allowed it to become the most advanced on Earth, leading to the progressive human society we observe today—an achievement not mirrored in animal communities. Neuroscience studies how the brain predicts outcomes, how beliefs and meanings are formed, and how the brain chooses between alternatives, even when an immediately beneficial option is available. The brain often prefers to choose an option with greater future benefits, a capacity that is notably lacking in young children.

Neuroscience demonstrates that our brain has the capacity to learn and to store learned information for future use. Our brains possess learning capabilities that are absent in animals. We understand how our decisions might lead to various consequences, and we subsequently refrain from acting in ways that we do not deem beneficial. This process of decision making is more complex than classical conditioning or operant conditioning, and signifies a more advanced cognitive ability in humans. In other words, we possess the capacity for both self-control and abstinence.

Two recent books by neuroscientists have presented seemingly opposing views on the existence of free will [9, 10]. Additionally, discussions between figures like Kevin Mitchell and Sapolsky, despite drawing on similar neuroscientific findings, highlight a philosophical disagreement. If free will is defined as self-control, or as the ability to make decisions and choices based on past experiences and learned knowledge while also predicting the future, or if free will means responsibility towards others rooted in education, then yes, we possess free will. This is an interpretation derived from neuroscientific findings, not necessarily a claim endorsed by all neuroscientists. In practice, neither rejecting nor affirming free will adds to or detracts from the scientific value of neuroscience. Sometimes, as a neurologist, I am asked to provide opinions in court, and judges ask me whether an individual can manage their financial affairs—that is, whether they possess the necessary autonomy and will to engage in transactions or make a will. In these situations, as a neurologist familiar with neuroscience, I assess their capacity to make financial decisions. I do not comment on free will directly, nor is there a need to. Judges might infer from my assessments that an individual lacks free will, but this inference is not central to my role as a neurologist.

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Cite this article: Dr. Mohammadali Arami. (2026) The Riddle of Free Will: A Sub-topic debate in neuroscience. *Journal of Neurology and Neuroscience Research* 7(2): 247-249.

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